Fifteenth Year of Publication

Industrial FINISHING

Reg. U. S. Pat. Office

Devoted to Product Finishing in the Factory

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Letters from Readers

OF INDUSTRIAL FINISHING

These letters (and many others) were answered recently by the editorial department, but are published here to reveal certain interesting trends of desire and activity in the industry, and to encourage additional inquiries, comments and suggestions. Further information about any of them can be obtained by writing this office.—Editor.

Material Strainer for Spray Guns

In your February 1939 issue of INDUSTRIAL FINISHING (page 39) you review a Material Strainer for Spray Guns. Inasmuch as a phase of our production work consists of spraying, we are interested in securing further information about such a material strainer. We would appreciate receiving the name and address of the concern and when writing to the manufacturer we will give your publication due credit.—N. Y. Co. (Color Panels).

Information furnished.—ED.

Silk Screen Stencils

We would be pleased to have you give us the names of manufacturers of silk screen stencils.—W. I. Co. (Church Furniture).

Lacquer-Proof Crack Filler

We are looking for a material to be used in patching small defects in wood surfaces, said surfaces to be covered with a lacquer-base material.

We have been using a crack filler which is mixed with a small amount of water, pressed into the depression to be patched, allowed to dry sufficiently and then sanded smooth. However, when our lacquer-base material is placed on the work the patch has a tendency to shrink. A shellac burn-in is also unsatisfactory, inasmuch as the lacquer-base material causes the burn-in to raise up when applied.

No doubt you are familiar with manufacturers and products that will work satisfactorily in this case. If so, we will appreciate your furnishing us with a list of these manufacturers and their products.—S. F. Co. (Furniture).

A list of manufacturers of crack filler has been supplied.—ED.

Portable Sander

As a result of the publicity you gave a portable electric sander in February issue of INDUSTRIAL FINISHING, a client of ours in South Africa has become interested. If you wish to give us the name of the company manufacturing same, it might prove profitable to them.—D. & S. Ltd. (An Export Sales Organization).

Foliage Lacquer

We would appreciate very much if you would kindly advise us how we can get in touch with L. S. N. (head of scenic Dept., Motion Picture Co.) whose letter inquiring for a protective coating for foliage, etc., appeared on page 62 of your April 1939 issue. We have had considerable experience in furnishing materials of this nature; in fact, we

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furnished the material for coating the foliage used in the production of "Midsummer's Night Dream" a few years ago.—Trojan Lacquer Co.

The individual is with RKO Radio Pictures, Inc., Los Angeles, Calif.

Every one in our organization looks forward to the arrival of INDUSTRIAL FINISHING each month, as we find the publication very timely and always of considerable interest.—M. & W. Co.

Buffing Compound

In the May issue of INDUSTRIAL FINISHING, on page 25, we notice mention of a greaseless buffing compound. We are interested in this commodity and would appreciate your advising the undersigned just who we might contact for further information on this material.—C. R. Mfg. Co. (Radios).

It is The Lea Mfg. Co., 16 Cherry St., Waterbury, Conn.—ED.

For Exterior Masonry

In the May 1939 issue of INDUSTRIAL FINISHING, we note a letter from one of your readers which refers to an exterior finish for stone, etc. We have a product, called "Porce-Tite," which is in use for all exterior and interior painting of brick, stone, concrete, and other masonry surfaces. It is impervious to salts, acids (lactic acid included), gases, etc. We would appreciate the opportunity to send our literature, etc., to companies looking for a product such as ours. — Bedard & Morency Mill Co.

Burning-in Iron

Could you let me know who sells or makes electric burning-in irons for furniture repairing? One of my furniture accounts is interested in buying one of these.—A. D. N.

Names of a few manufacturers have been submitted.—ED.

"The Lea Method of Finishing"

Editor's Note: A free book with the above title was mentioned in June 1939 issue, page 26, but through error the publisher's name was not

Are Your Finishing Costs Too High?

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Automotive Finishes
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The Emblem of Quality in Finishes

The above list is by no means complete, but we trust it will serve to give you an idea of the extent to which WALKER'S chemical staff has solved problems submitted to it.

H. V. WALKER CO.
ELIZABETH, NEW JERSEY

FINISHES To Fit the Product

New England Warehouse
BROWN & DEAN CO., Providence, R. I.

given. It is The Lea Mfg. Co., 16 Cherry Ave., Waterbury, Conn. Inquiries for the book have been forwarded to The Lea Mfg. Co.—all except one dated July 6, from Mr. J. E. Grady, who failed to write his address on his letter.

Burn-Proof Lacquer

On page 46 of your January 1939 issue, you describe to some extent burn-proof lacquer No. 3079. We would be pleased to have you furnish us with the names and the addresses of the manufacturers of this burn-proof lacquer in Canada and the United States. — S. Cycle Products, Ltd., Canada (Bicycles, Tricycles).

The name of this company and several others who claim to have a burn-proof finish material, have been forwarded in reply to the above.

In April issue of INDUSTRIAL FINISHING, page 64, there is an inquiry relative to a varnish that is "Cigarette Proof" or resists burning. We are interested in this product and would ask you to be so kind as to give us the names of such products or manufacturers.—A. A. Co. (Painters' Supplies).

Viscosity Tubes

In the June 1939 issue of INDUSTRIAL FINISHING magazine, we note two articles which mention the use of Cargille tubes in the measurement of paint viscosity by the bubble method, and editorial reference is made to R. P. Cargille as supplier of these tubes. We would appreciate very much your furnishing us with the address of the above mentioned R. P. Cargille, in order that we might obtain some of these viscosity tubes.—P. G. Co. (Industrial Finishing Equipment).

See ad in July 1939 issue, page 66.

Cedar Oil Questions

We are sending you some reprints of articles published in INDUSTRIAL FINISHING on Cedar Oil, which we offer in a non-evaporating form under the name of Ced-R-Wood . . . .

Some of the replies we have gotten on this subject have been amusing. One man wrote and asked if he used it on his dog, would it eliminate fleas! He said he was seriously con-

(Continued on page 59)

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Flocking Greeting Cards

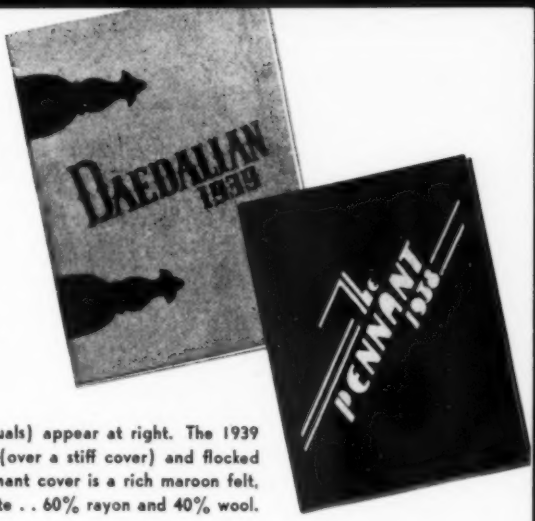
Stencil flocking, in one or more colors, is a decorative feature that can be used effectively on a variety of manufactured items, and it is of interest and value to learn some practical details about the methods of doing this work on greeting cards and book covers.

BY H. H. MENEFEE

EACH DAY finds us unearthing some new and novel uses for flock—and finding new methods of applicating this decorative material. Flocks, you know, are minute particles of ground cotton, wool or rayon that are applied by being forced into a sticky binder of a similar color—to produce a soft, nappy, raised finish resembling cloth.

The greeting card industry is rapidly taking over flocking—adapting and using it quite extensively on all types of greeting cards. When applied to a card or plaque, the flock gives a raised or appliqued effect that heretofore has been too expensive to use. Several typical cards that have flock on them are illustrated on this page.

The types of cards on which flocks are used can be easily divided into three groups; namely, the cards to sell for approximately 10c, the 35c to 40c cards, and the finer handmade cards or plaques. Of course, each of the



Greeting cards at left:
1) Poinsettias are in bright red flock; ½ wool, ½ rayon, against a green background, with silver insert.
2) Little black bears are done in black rayon flock, a most realistic finish.
3) Drawers, red rayon flock.
4) Cactus, dark green flock.
5 & 6) Ribbon, hat and holly berries, bright red rayon.
7) Hat is black wool flock.

Book covers (for college annuals) appear at right. The 1939 Daedalian is in monk's cloth (over a stiff cover) and flocked in dark brown. The 1938 Pennant cover is a rich maroon felt, which is stencil-flocked in white . . 60% rayon and 40% wool.

rds and Book Covers . . . .

different types of cards requires a different method of application to coordinate with its ultimate cost.

The cheaper cards are usually printed or lithographed on bond paper, using an ordinary printing ink, at a rate of speed that will keep the cost down to a minimum. To apply flock to a small portion of such cards, the colors and designs are run as usual and then the portion to be flocked is printed with an ink to which has been added lithographed varnish (a good mixture for regular bond paper is 10 parts ink (no drier) to 25 parts heavy lithol varnish).

When printing the binder the speed of the press should be slowed down to about 500 impressions per hour. If the paper is highly absorbent it may be necessary to double-print the binder. After the binder is applied the cards are run through a flocking machine or attachment. There are several of these machines on the market today. Many are in use that were built to fit the needs of the particular plants in which they are used.

The working principle in all flocking machines is practically the same — similar to what is shown in the rough sketch printed on a following page. It consists of an endless belt on which are placed the cards "printed" with the sticky binder. As a card passes a certain point, flock is either blown or piled onto it. On some machines there is an eccentric wheel that "spanks" the belt to aid the adhesion; however, the newer machines rely entirely upon

the pressure with which the flocks are blown onto the binder for the proper adhesion.

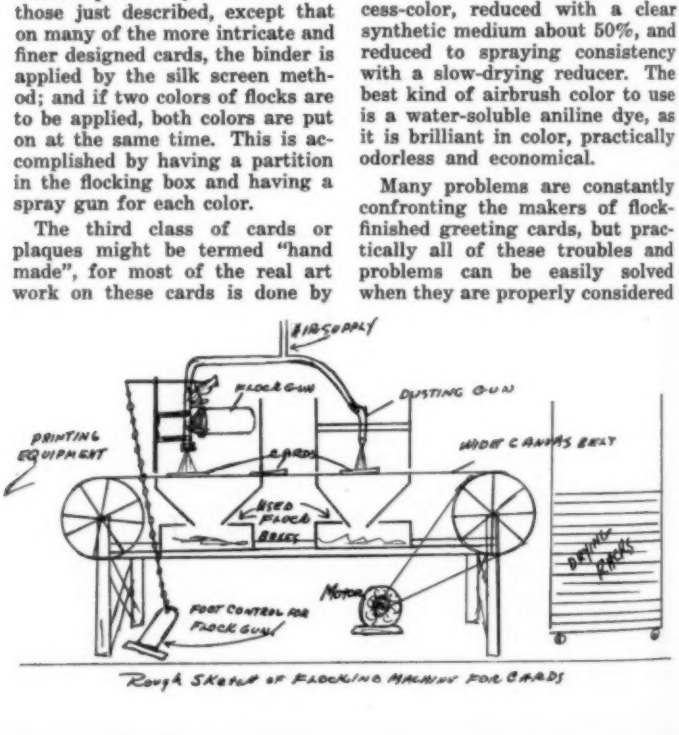
The endless belt passes through a box or container in order that the excess flock can be reclaimed for future use. When cards leave the machine they can be stacked in small piles immediately, as the flock coating on one side prevents the binder from coming in contact with the backs of other cards. Rayon flocks 1/16-in. in length are probably the best type to use on cards, because of the nice sheen produced.

Cards of the second class are flocked practically the same as those just described, except that on many of the more intricate and finer designed cards, the binder is applied by the silk screen method; and if two colors of flocks are to be applied, both colors are put on at the same time. This is accomplished by having a partition in the flocking box and having a spray gun for each color.

The third class of cards or plaques might be termed "hand made", for most of the real art work on these cards is done by hand. Of course, the lettering, designs and some illustrations are printed in the usual manner, and the flock adhesive is either screen processed or sprayed through an open stencil, and then flocked by using a special flock gun. It is on this class of cards that often times large surfaces are flocked and then different designs are stenciled or shaded on these large surfaces of flock to give most pleasing and startling effects.

This shading and stenciling work is done by hand with an artist's airbrush. The type of binder to use on such jobs as these is a delayed-drying synthetic process-color, reduced with a clear synthetic medium about 50%, and reduced to spraying consistency with a slow-drying reducer. The best kind of airbrush color to use is a water-soluble aniline dye, as it is brilliant in color, practically odorless and economical.

Many problems are constantly confronting the makers of flock-finished greeting cards, but practically all of these troubles and problems can be easily solved when they are properly considered



Rough Sketch of Flocking Machine for Cards

and dealt with. I have had opportunities to work out numerous troubles. Every time a problem is worked out many new and interesting things are learned about the process and it is in this way that new uses and ideas for flock are conceived and executed.

In making book covers, where flock is used for the lettering, design, borders, bands, etc., practically the same methods are used and the same difficulties are encountered as in making greeting cards. Of course, book covers are more expensive and require more hand work and more actual personal supervision. In view of all these facts, some of the cleverest and most novel, as well as outstanding covers have been produced.

Illustrations in this article show some examples of book cover decoration that would have been impossible had it not been for the flock finish that was used. For example, the 1938 Pennant cover is a rich maroon felt background on which the customer insisted on having white letters. In applying white pigments over maroon backgrounds there is always considerable difficulty encountered with the bleeding of the maroon color. This fact alone was enough to show that offset, regular prints, block print, or even open stencils, were out of the question. I was contacted as to what could be done about this particular job. Here is my outline on to how to do the work:

1) The finish to use was flock —60% white rayon, 40% white wool flock.

2) The binder would have to be applied by the silk-screen process method.

3) The binder (a special mixture) would have to be 40% synthetic process (for flexibility and penetration), 20% flat oil process color (to prevent bleeding of the maroon and to increase opacity), 20% synthetic base or false body media (to prevent excessive penetration of the color into the cloth, and to form a body for a binder for the flock), and 20% clear synthetic varnish (to temper the color to squeegeeing consistency and also to give the false-body material the necessary tack or stickiness for proper adhesion of the flock).

4) When screening the binder on the felt background, it would be necessary to exert an excess amount of pressure on the first pull of the squeegee (to impregnate the cloth properly with the binder) and ordinary pressure on the second pull (to assure coverage) and an extremely light pressure on the third pull of the squeegee (to leave a heavy deposit of binder to prevent bleeding through to the surface of the binder, and to have an adequate amount of binder for the flock to adhere properly).

5) The air pressure at the flock gun should be approximately 40-lbs., and one coat of flock was to be applied with the gun at a distance of about 9-in. from the work; and another immediately following with the gun at approximately 18-in. distance.

6) This was to dry overnight and the excess flock was to be blown off with a duster gun, or removed with a portable vacuum cleaner.

7) To insure a perfect job, the following precautions were set forth:

A) The temperature was to be above 70°F.

B) The atmosphere must be absolutely dry.

C) The maroon felt must be clean and dry.

D) An additional water trap should be inserted in the air line to the flock gun to remove all the moisture from the air.

E) All flock to be used, should be sprayed through the flock gun into a container to break up all lumps or balls of flock that might be present.

F) All spraying of flock should be done in a separate room from the screen work to prevent the flock from settling on the screen.

The complete cover of the Daedalian book, illustrated at the beginning of this article, is made of monk's cloth mounted on paper and flocked in a dark brown rayon flock. The other Daedalian cover is regular burlap backed with paper and flocked in a dark brown color. Both of these covers give a most pleasing effect and they carry out the rugged individualism that is so prevalent throughout the entire book. The work on these covers was done according to the foregoing schedule, with exceptions of the mixture of the binder and flock. The binder was half and half brown synthetic process color and synthetic transparent base. The flock was 100% brown rayon flocks.

Touch-up and Repair Finish Book

A new and comprehensive bulletin containing detailed information on how to touch-up or completely refinish refrigerators where the original finish was "Dulux" enamel is announced by the Du Point Co. Given the title of "Refrigerator Touch-Up and Repair Work," the bulletin is divided into two sections. One explains methods for touching-up or spot repairing panels with "Duco" lacquer. The other gives directions for complete refinishing of the cabinet with air dry "Dulux" enamels or "Duco" lacquers. Specific materials are listed for each purpose.

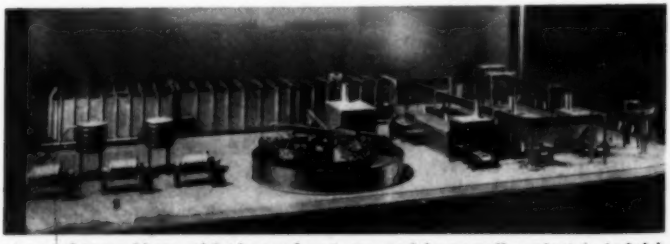
A copy of "Refrigerator Touch-Up and Repair Work" may be obtained by writing to E. I. du Pont de Nemours & Co., Inc., Room 7156 Du Pont Bldg., Wilmington, Del.

Wrinkle Finish for Flexible Goods

New Wrinkle, Inc., Dayton, Ohio, has recently signed up Taunton Coating Mills, Inc., Taunton, Mass., as licensee for the manufacture and use of wrinkle finishes adaptable to flexible materials application. The wrinkle finishing of fabrics, leather and paper lends a new set of possibilities to the trades converting flexible materials into finished products. Its striking appearance and wide range of colors are representative of a new sales appeal constantly sought for merchandise from flexible materials.

Starr Joins Lea Mfg. Co.

The Lea Mfg. Co. of Waterbury, Conn., manufacturers of Lea Compound and Learok, polishing and buffing compounds, announces the appointment of William D. Starr to its research staff. Mr. Starr, Yale '27, was formerly manager of the Eastern Engineering Co. of New Haven, Conn.



A complete working model of a modern-type porcelain enameling plant is included in the booth of Ferro Enamel Corporation, at the New York World's Fair.

CHOICE OF REDUCERS FOR ECONOMICAL

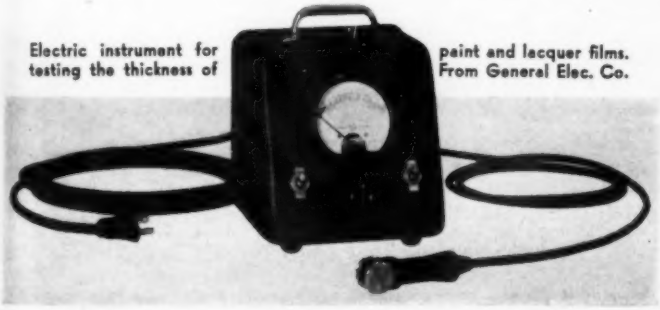
Film Thickness Control

BY W. G. SHEANE
Chemical Engineer,
General Electric Co.

The author discusses the use of modern extender and solvent-type reducers for industrial organic finishing materials from the standpoint of film-thickness control. This is an interesting study of one of the problems occupying the attention of the finishing field in its efforts to produce the lowest costs consistent with quality.

MUCH HAS been said and written for the use of reducers that will yield a desired consistency in finishing material, with the addition of the least possible volume. One of the strongest arguments in favor of this is the fact that the less reducer necessary per unit volume of finishing material, the lower the overall material cost per unit weight of applied solids. Reducers perform no positive function other than to make a mix suitable for application and, since they are eventually lost in the curing process, it would seem most economical to use as little of them as possible.

However, consideration must be given to the opposite viewpoint in the use of reducers. In some instances it is conceivable that large additions of thinner are desirable—and sometimes even necessary—not because the final mix will go farther, all other things being equal, but because thin cured films can be obtained. For example, certain of the newer materials depend on extremely thin films for their final physical char-



Electric instrument for testing the thickness of paint and lacquer films. From General Elec. Co.

acteristics, actually becoming worthless for the purpose for which they were designed when used heavily. In another case, manufacturing costs may dictate the absolute minimum film possible for decoration—where protection, in the strict sense of the word, is of secondary importance.

In any event, field experience usually shows some definite film thickness to be best, considering certain conditions and requirements. To go beyond this is wasteful, and to use less invites early loss of protective and decorative value, and customer complaint. And so the answer really lies in the control of film thicknesses.

A survey of the facts will show that final material costs depend not so much on reducer cost but rather on the effect of reducers on the ultimate film thickness.

Solvents and Reducers

From the standpoint of control, two general types of reducers may be used, singly or in combination, in either high or low thinning ratios, as required. The first type possesses the ability to make reductions with relatively small additions and, as differentiated from the second group, may be termed *solvents*. Dilution of full-bodied materials with solvent-type reducers is low and as a consequence the solids content of the mix remain high. Finishing materials so prepared allow the application of single films which when cured are comparatively thick.

In the second class are those reducers which may be described as *extenders*. Their nature is such that larger volumes are generally required in order to arrive at a suitable mix. Since the reductions are lower than those involving solvent types, the solids content per unit volume at the point of application is lower, and thinner cured films can be obtained.

A Typical Case

Consider an example of finishing material cost involving various reducers. An organic finishing material is adjusted for application by the addition of *Reducer A* in the ratio of four volumes of full-bodied material to one of reducer (20% reduction). The solids content, viscosity, etc., of this mix is such that the final cured film averages .00125-in. in thickness. However, a series of tests based on field performance shows that a film of not more than .00105-in. is necessary to give satifactory protection and decoration. Since this difference represents an appreciable saving, a first effort is made to reduce the thickness of the final film by using more reducer in the mix. This procedure does lower the solids content per mixed volume and should give thinner films, but the additional reducer so changes the application characteristics that uncontrolled sagging and running results.

At this point the manufacturer of the finishing material is consulted for his recommendations. His laboratory finds that two other reducers, both slightly higher in price than *Reducer A*, can be used without adverse effect on either the application of the material or on the durability and appearance of the finish. The extending action of both reducers is greater than that of *Reducer A* and, to secure handling characteristics similar to the mix in production, a 3 to 1 ratio (25% reduction) for *Reducer B* and a

	Reducer A	Reducer B	Reducer C
Percent Reduction	20.0	25.0	28.6
Percent Solids Contents	49.2	46.1	43.9
Cured Film Thickness (inches)	.00125	.00115	.00109
Relative Reducer Cost per Gallon	100.0	108.0	115.0
Relative Overall Material Cost per Piece	100.0	95.8	93.5

2½ to 1 ratio (28.6% reduction) for *Reducer C* is required.

A few simple calculations show the relative data revealed in the above table.

Before making any change a semi-production run is made to check the computed figures. In all three cases it is found that approximately the same volume of reduced material is used per piece. The various mixes show an appreciable difference in application and the labor cost remains unchanged. Obviously, *Reducer C*, used in a 28.6% reduction, strikes closest to the desired figure of a 0.00105-in. film thickness. Nothing has been lost and there is a saving of approximately 7% in overall material costs, despite the fact that the new reducer is more expensive per volume than the one originally used.

One of the most important factors in economical finishing is the control of film thicknesses. This can be accomplished in a large part through the use of proper reducers, designed toward the end of producing a working balance between consistency for application and the thickness of the final film. With the ever-widening knowledge and number of reducers of all types, the problem is becoming increasingly simple and savings realized by intelligent choice of materials for their characteristics in production.

Much of the practical information and many of the methods, which are supplied to various manufacturing establishments throughout the United States come from or through "Industrial Finishing" magazine. Inquiries are answered from information on file or through individuals or concerns who are specialists in the knowledge asked for.

Further information is revealed as a result of publication of various inquiries and replies in the "Questions and Answers" and "Letters from Readers."

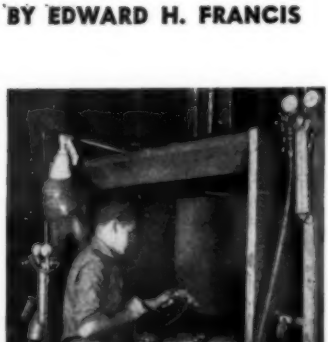
Recently a manufacturer asked for data on the design of induced-draft exhaust systems for paint spray booths. After his inquiry had been serviced he wrote the Editor as follows:

"I am pleased with the kind way in which you have handled my inquiry for information on spray booth exhaust. The information that has been sent, as a result of your efforts, has been very interesting. I am filing this information and know that it will be a great help."

This case is typical of thousands of others. "Industrial Finishing" welcomes inquiries and strives to give every one prompt and effective service—and the Publication keeps confidential those inquiries that are so specified.—The Editor.

How to Take Care of Yo

BY EDWARD H. FRANCIS



In this second part of an article started in June issue, the author explains timely and valuable facts about the cleaning, maintenance and correct adjustment of spray gun cups and pressure containers, air cleaners and regulators, spray booths, baffle plates, fan blades, motors and exhaust equipment.

ALWAYS CLEAN the spray gun cup thoroughly immediately after using it. Pour material from the cup and remove the excess film with a rag. Place a quantity of suitable solvent in the cup and spray it through the gun and cup until the cup is clean. Blow all parts with compressed air and wipe with a clean cloth. Make certain that all material is removed from the crevice at the bottom of the cup.

Keep the air vent hole in the cup lid clean and free of all accumulations of finishing material. A clogged vent causes a jerky or fluttering spray and eventually prevents material from flowing to the gun.

Clean the threads and seat of the coupling nut, which is located above the cup lid, so that it can be tightened securely to the fluid inlet nipple of the gun. Worn threads or a loose nut will cause a jerky spray. A loose or cracked fluid tube in the cup will also cause a jerky spray.

Pressure-Feed Tank and Cup

The operating principle of the regulated pressure cup and tank are practically identical. However, the maximum pressure capacity of the cup is limited and should be determined before the operation. The pressure regulator on the container lid controls the flow of material from the gun, therefore it must be kept in good working condition.

To prevent breakage of the

# of Your Spray Equipment

regulator diaphragm, release the regulator adjusting screw whenever the container is not in use.

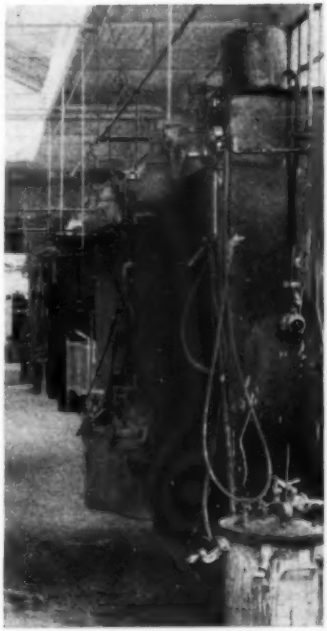
Never plug the small hole in the regulator cap to prevent air leakage, as this will prevent proper pressure regulation. Air leakage from this opening indicates a broken or improperly seated diaphragm, or a loose regulator cap. Reseat or replace the diaphragm and tighten the regulator cap securely in position. Keep the safety valve clean and in working condition at all times.

A regulator protector is located beneath the lid to prevent material from entering the air passages. Inspect and clean this periodically, as a clogged protector prevents air from entering the container.

To prevent air leakage, keep the lid gasket and the adjoining container surface free of any paint accumulation. Always clean the paint container, hose and gun immediately after use.

Should the pressure in the container rise above the desired regulated pressure, it is caused by an air leakage around or through the regulator valve assembly. Remove the regulator cap and check the following:

1) Determine if valve is leaking, while cap is removed, by placing a little water or oil around the valve assembly and openings. If no leakage occurs, the trouble is elsewhere. If the leakage is around the valve assembly, tighten this securely in



position. If the leak is through the openings, remove the valve assembly and inspect the valve and seat for dirt or wear. Clean all parts before reassembling them.

2) If no leakage occurred after making the inspection and tests just outlined, place the diaphragm against the face of the casting that contains the valve. If the valve is opened by this operation, the adjustment of the valve is incorrect. The valve must be flush

with the diaphragm when the latter is in position.

The Air Transformer

The air transformer cleans and regulates the compressed air that you use for spraying. This transformer should be drained daily, or more frequently if necessary, to remove the accumulated moisture.

The internal cleaning section of the transformer should be removed and cleaned at such intervals as local conditions demand. If the transformer contains waste, felt, steelwool, etc., it may require replacement. Do not overload it when repacking, as this would retard the air flow.

Air regulator problems are the same as discussed under the paragraph heading entitled "Pressure Tanks and Cups".

If moisture continues to pass through the transformer, check the following:

1) Drain transformer and air receiver of compressing unit.

2) Locate compressor where air is as cool and dry as possible. Unit should not be located near steam outlets, etc.

3) If the compressor is water cooled, make certain that no water is leaking into its cylinder.

4) The transformer must be placed far enough from the compressor unit to permit the compressed air to cool before reaching the transformer.

5) Horizontal piping should slant slightly toward the air receiver, and should enter the receiver near its top.

6) In localities where moisture content of the air is excessive, a moisture trap or condenser should also be installed in the line.

Good housekeeping about the spray booth and spray room assists greatly in producing satisfactory finishes, improves working conditions, and minimizes fire hazard.

The installation of booth, fans, ducts, lights, switches, etc., should be in accordance with the underwriters' code. Openings are provided in the booth for the installation of sprinkler heads.

Before starting spraying operations, and after cleaning, apply to all exposed parts of the booth, such as inner walls, plates, fan blades, etc., a coating of non-inflammable shield (or masking paste) to facilitate paint removal.

The interior of the booth, fan blades, etc., should be cleaned of residue at least once a week, and more frequently if conditions demand it. If scrapers are used in the cleaning process, they must be of non-sparking metal such as brass or copper.

Exhaust Ducts and Fans

The exhaust duct should contain clean-out doors, placed about every 10-ft., to permit cleaning. The exhaust duct should never be of smaller diameter than the fan, and bends or elbows should be avoided wherever possible.

Fans and fan motors should be inspected and lubricated in accordance with the manufacturer's recommendations.

Spray rooms should not be so tightly closed as to prevent the entrance or infiltration of air—unless you have a sealed air-conditioned room into which an ample supply of filtered air is introduced by fans. If the exhaust fans remove more air than enters the room, a partial vacuum is established and the effectiveness of the fan is destroyed. Of course,

in modern air-conditioned spray rooms, windows and doors are kept tightly closed (doors being opened only when necessary) but clean filtered air is supplied through the air-conditioning system. In fact a slight excess of air is supplied so that if a door or window is opened the air flow through the passage will be outward from the room to prevent the entrance of any outside dust or dirt.

Machinery Repainting

DEALERS IN used machinery are confronted with the problem of putting a dress-up paint job on many used machines to give them resale appeal. But this cleaning and repainting of used machinery can run into important money. In this article I suggest a method of producing an economical cleaning and repaint job for used equipment.

For cleaning, start with a bucket of kerosene and a stiff bristle brush. Begin at the top and work down. Don't bother about wiping. The kerosene doesn't evaporate rapidly but remains damp and continues to act on the dirt and grease. After a complete scrubbing with kerosene, fill a spray-gun cup with naphtha, adjust the spray so that it shoots a concentrated fan, and then wash off the kerosene with the naphtha spray. Begin at the top and work down. This will rinse off all of the dirt and grease. Use as much air pressure as you can get—at least 90-lbs. if possible.

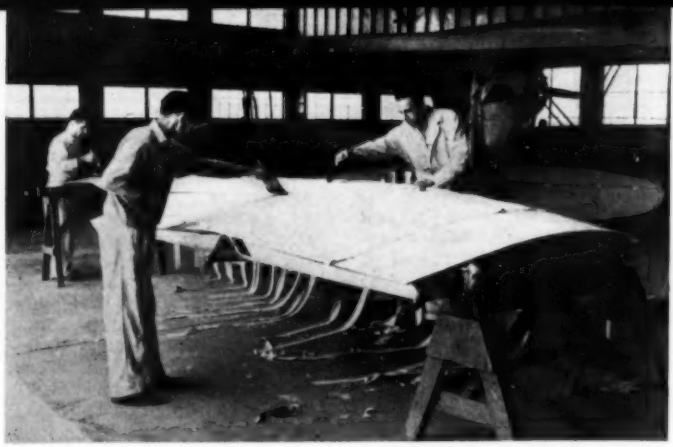
The reason for using naphtha after the kerosene is because the kerosene is oily and would leave an oily film that would float to the surface after the machine had been painted, causing a dingy appearance. When naphtha is used as a final blow-off rinse, it soon evaporates so that wiping off with rags is unnecessary.

One of the costly operations in spray painting used machinery is the covering and masking of bright parts that are to remain unpainted. Masking can be eliminated by cutting around these bright parts with a paint brush before the machine is sprayed. If it is in a bad condition and if oil seeps from numerous joints it is well to spray on a coat of shellac.

Experience has proved that a gray machinery paint produces best results. Gray does not show up the scratches and rough parts, and it covers well in one coat. When spraying, have the spray gun adjusted to spray a narrow (3 or 4-in.) fan in order to avoid fogging the bright spots. If any bright parts are fogged they should be quickly wiped with a cloth dampened in thinner before the paint sets. Use low air pressure—just enough to atomize the paint satisfactorily. The paint should not be thinned any more than is necessary. A careful workman soon becomes accustomed to this type of spray painting and he can skillfully spray around bright machined areas without fogging them. In some cases he can use a small flat panel as a shield. The important thing is to avoid fogging by using the paint heavy enough to prevent it from blowing around. — H. H.

Reports Business Increase

Mr. T. F. McGuire, President of The Schaefer Varnish Co. (lacquer, varnish, enamels), Louisville, Ky., reports that "June was our best month in sales since we started. Business is fine, especially on high grade materials."



Finishing Fabric Covered

IF YOU stop a moment to think about the word FOUNDATION, you will realize that practically everything in this world of ours must have a foundation or background—and you will find that a paint job is no exception to this rule.

In my estimation, the foundation or base of a paint job is the most important part of the complete routine. If carelessness enters into this part of the procedure, the whole job will very likely collapse prematurely. If the finisher will bear this fact in mind, then finishing troubles will be the exception rather than the rule.

In this article I will endeavor to outline the various steps necessary to produce a good looking pigmented dope finish on fabric-covered airplanes.

When the wings, fuselage and tail group have been covered with fabric, they are ready to be doped. The first application on the job will be a coat of clear dope applied full strength and brushed well into the fabric. This doping should be done in a properly ventilated room at a temperature of about 70°F. When the first coat of dope has dried, (about 1½ hours) the second coat is applied in the same manner. In approximately two hours the second coat should be sufficiently dry to allow a light scuffing with No. 120 "Cutrite" sandpaper.

This second coat will have pulled the fabric tightly enough to allow the tapes to be laid with the next coat of dope. The tapes are made of the same kind of material that is used to cover the 'plane. They are usually 2-in. in width and have pinked edges. These tapes are doped down on the fabric wherever any part of the interior structure of the airplane comes in contact with the

Illustration at left shows men laying the tapes after a second coat of dope has pulled fabric tightly over the wing structure.

Right: Doping a fuselage after all of the tapes have been laid.

ed Aircraft . . . . BY W. L. PLUMMER

fabric. This reinforcement gives the fabric a double thickness where excessive wear is likely to occur.

Doping; Sanding; Coating with Aluminum; More Sanding

After all the tapes have been laid, you then apply by brush, or by spraying from a pressure pot, as many coats of dope as are needed to obtain the finish required. The average airplane is covered with six or seven coats of dope. When the last clear coat of dope has dried out sufficiently, it should be given a careful and thorough sanding with No. 120 "Cutrite."

The aluminum coats are applied next. These will consist of two cross coats of aluminum dope, which must be sprayed on. Aluminum dope is made by mixing 4-oz. of No. 200 mesh bronze powder into each gallon of clear dope. The aluminum coats should be allowed to dry from eight to ten hours; then wet-sanded with No. 180 wet-or-dry sandpaper. I attach a great deal of importance to this particular sanding, because the smoothness of the final finish depends upon the quality of this sanding job.

In order to speed up the sanding of this part of the process, I let a machine sander do the work. The particular type of machine I use is a portable, air-driven, reciprocating-block sander. The single sander pad moves back and forth, as in hand sanding but, of course, it moves more rapidly. On a job of any size, this portable sanding machine can do the work of about three men.

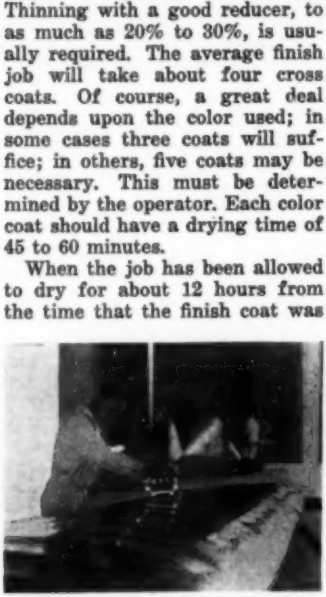
When using the sanding machine, care must be taken to avoid sanding through on the rib-stitching or other high spots. The aluminum coats serve as a convenient guide for this sanding. They also protect the clear dope

coatings from the actinic rays of the sun.

Color Coats; Rubbing Out

Upon completion of the sanding, all surfaces should be thoroughly cleaned before applying any color coats. Pigmented dope is applied as heavy in viscosity as possible; of course, this will be determined by the type of equipment the operator has in use. Thinning with a good reducer, to as much as 20% to 30%, is usually required. The average finish job will take about four cross coats. Of course, a great deal depends upon the color used; in some cases three coats will suffice; in others, five coats may be necessary. This must be determined by the operator. Each color coat should have a drying time of 45 to 60 minutes.

When the job has been allowed to dry for about 12 hours from the time that the finish coat was



Sanding the finish with portable sanding machine—after the aluminum coats have been applied and have become really dry.

applied, it may be rubbed out, if a high polish is desired. The method for rubbing out is as follows: Wet-sand lightly with No. 400 wet-or-dry sandpaper; then follow over with a good "compounding" (application of rubbing

Rubbing the finish with compound, using a small compressed air-rubbing machine.

compound). Best results will be obtained if the compound is rubbed across the sandpaper marks that were left in the finish. I have found, through past experience, that scratch marks can be taken out much more readily in this manner.

Although it is possible to "compound" (rub) the finish by hand, best results will be obtained by using the sanding machine with a regular rubbing block attachment that goes with it. This rubbing block is not flexible like the sanding block but is flat and rigid, all of which tends to produce a fine satin finish.

Brochure Pictures Cleaning in Major Industries!

An interesting 48-page illustrated brochure, attractively bound, portraying the important part that production cleaning and its related operations play in 40 different industries, has just been issued by Oakite Products, Inc., New York, in connection with its 30th Year Anniversary. It is said this is the first time that the story describing the scope and influence of industrial cleaning in industry has been published in so complete a form. The text matter is concise and contains much statistical and historical data bearing on the contributions made by American industry to the nation's economic progress.

Rubbing and Polishing

VARNISHED, LACQUERED AND SYNTHETIC FINISHES

An experienced foreman finisher gives practical suggestions and recommendations about water rubbing and oil rubbing; and how to use pumice, and fine wet sanding by hand or portable machines, on wood cabinets, furniture trim and fixtures finished with varnishes, lacquers, synthetics. He also reveals information about how to polish these surfaces with various materials.

BY F. R. BOYNTON

THE GENERAL public's preference for the highly polished and gloss finishes of earlier years has given way to the popular liking for a more natural dull luster finish on wood furniture, fixtures and trim. Woods like walnut, mahogany and oak present a much richer appearance on walls, panels and furniture when they have their historically correct dull-rubbed finish. Rubbing tends to remove that unnatural gloss of newness, thereby permitting these fine woods to take their place unobtrusively in the general decorative scheme. A high gloss surface produces light reflections which detract from the real beauty of the wood grain and its natural shadings.

The finished surfaces commonly rubbed are those coated with gloss and flat lacquers, gloss and flat varnish, gloss enamels and some types of synthetic coatings. Different types of surface coatings have certain peculiarities and require careful study if the best results are to be obtained.

Oleoresinous Varnishes

Rubbing varnishes of the oleoresinous type are short or "medi-

um length" in oil. They must dry hard and firm to be capable of withstanding abrasive rubbing with pumice and water or pumice and oil. They must stand what abrasive action it takes to cut down any inequalities, roughness or grit accumulations. Also, they must be impervious to the presence of water or oil on their surfaces during rubbing operations. The dry film of rubbing varnish must "cut off sharply" and not gum up the rubbing pad like a long-oil varnish would. Some varnish films become soft from the heat generated by rubbing; others absorb moisture or oil and take on a clouded effect.

The finest kind of surface is produced by water rubbing the

An air-driven portable rubbing machine.

undercoats with pumice stone and water, followed by a thin flow coat which, when dry, should be rubbed dull or polished. Water rubbing is rather expensive because the surface has to be dulled to produce the final satin finish.

Rubbing Oils; Felt Pads; How to Use Pumice Stone

Oil rubbing produces a satisfactory dull finish on varnish but it does not produce the same sheen as a water-rubbed surface. The water-rubbed surface has an entirely different "feel" to it, being a much smoother surface. Various oils on the market are used for rubbing, but paraffin oil is generally used for rubbing a varnished surface. It provides an excellent lubricant. Pumice stone, grade 3/F, is correct for use with oil rubbing. To apply the pumice stone and oil, I prefer to use a block of soft felt. Hard felt will often "burn" the surface and cause the finish to sweat from overheating.

After the surface has been oiled, sprinkle enough pumice stone over it to do the entire job. As the rubbing work progresses these particles of pumice stone are ground finer; to add fresh pumice stone often causes scratches. Rub the surface progressively, using strokes of equal length, and rub plenty of oil on the surface to prevent overheating. Wet-or-dry sandpaper and stroke machines (both portable and stationary) are also useful in rubbing finished flat surfaces.

Polishing a Varnished Finish

To produce a highly polished surface it is imperative that the pores are filled flush and that the preliminary coats have had sufficient drying time between coats. I suggest a full coat of shellac or sealer, sanded smooth, and followed by three coats of varnish (the first and second coats of varnish being sanded when dry). The third coat of varnish is a special material made for rubbing and polishing. After the surface has been water-rubbed and the pumice stone has been cleaned off, the finish is ready for the polisher.

The polisher rubs the surface

with rottenstone to remove the fine scratches that have been left by pumice stone. The polishing lubricant is different from that used in rubbing. There are several different formulas for polishing lubricants, but a mixture of equal parts of sweet oil and alcohol will produce an excellent polish. Cotton batting or fine waste may be used for the polishing ball.

The ball is dipped into the liquid and then firmly squeezed to wring out the excess material. Rottenstone is applied to the polishing ball in moderate quantities and a circular motion is used to polish the finished surface. After the surface has been polished free from scratches and has the desired luster, the oil is wiped off. Finely powdered silex is then sprinkled over the surface and wiped up with the palm of the hand, with a motion similar to that used in polishing. This is called "handing up". Cheesecloth is used to further clean and polish the surface.

Rubbing Lacquer Finishes

The full body of a lacquer coating does not show up until the surface has been rubbed. This is due to the lower sheen of the lacquer as compared to varnish. It is the light reflection from a polished sheen that gives depth to the coating. Of course, there are some gloss lacquers that have an excellent sheen, but these are generally formulated about 1:3, and resemble the pthalic resin coating more than lacquers.

The same procedure is used to rub lacquers that is employed in rubbing varnish—only oil rubbing is more popular. When felt is used as a rubbing pad, I prefer to use a felt that is very hard, as this will aid in cutting down the surface more rapidly. Very smooth surfaces may be produced by wet sanding with wet-or-dry sandpaper; in fact the use of wet-or-dry sandpaper accelerates the rubbing operation considerably.

There has been some trouble with the cloudy film that remains on the surface after rubbing. Lacquer films are porous and, in the rubbing process, fine pumice stone is ground into these microscopic pores. After the oil dries, the pumice resumes its gray color and, in connection with the oil film, the result is a grayed scum on the surface. On surfaces that are rubbed too soon (insufficient drying time) this condition will be particularly noticeable. This gray film may be cleaned off with a homemade cleaner or one of several suitable cleaners that are now on the market.

Polishing Lacquered Surfaces

To obtain a first class polish on a lacquered surface, the finish should be wet sanded before the final coat of lacquer is applied. This sanding smooths down the roughness of the preceding coats and, as a consequence, the final finish will rub and polish much more easily. The final coat can be rubbed with one of the various rubbing compounds on the market. Further gloss may be obtained by applying a good lacquer polish.

Synthetic Coatings

The best types of synthetic finish coatings suitable for rubbing, are generally formulated with rosin, a modified phenolic resin or fused or esterfied Congo gums. These coatings may be rubbed

just like ordinary varnishes. The process will require more effort because of the greater hardness of the film. Pthalic resin finishes, having a soft film, should be allowed plenty of drying time before rubbing.

Flat Finishes

A flat finish is often used on the cheaper grades of furniture and fixtures, where price competition must be met. These flat finishes do not require much rubbing —if any. An excellent rubbed effect can be obtained by rubbing the finish with fine steelwool lubricated with paste or liquid wax. This treatment produces an excellent sheen and gives a moisture-proof surface.

Rubbing Machines; The Value of Rubbing

Rubbing machines are now on the market and their use accelerates rubbing operations considerably. It is wise to use them whenever and wherever they are adaptable to the work. Hand rubbing involves strenuous labor, but if the workman will use his head more and his muscles less, the result will be more production and a better job of rubbing.

In the production of quality furniture, rubbing is of real importance. This work has always been more or less expensive; in some shops it has been curtailed, while in others it has been entirely eliminated from the finishing schedule. Nevertheless, quality furniture will not show up to good advantage unless it has that rich luster of a rubbed finish which brings out the depth of the surface coating and enhances the grain and figure of the natural wood. Assuming that a wood surface has received enough finishing material to build up a satisfactory film, and that it has been properly rubbed, then that coating has a better chance to stand long service without breaking down prematurely.

New Folder Describes Ketones

Carbide and Carbon Chemicals Corp. announces the publication of an attractive new folder entitled, "Synthetic Ketones." Known as "Chemical Group Folder No. 6," this publication is the first of a series of new folders which are designed to present, briefly and concisely, information on various organic chemical families. The present folder covers the applications and properties of 14 synthetic ketones which are used as industrial solvents and intermediates. A convenient table shows boiling points, vapor pressures, solubilities, and other properties in a form in which they can be easily compared. Other folders of the series, soon to be published, will give similar data on alcohols, glycols, amines, acids and other organic families. Copies of "Synthetic Ketones" can be obtained from Carbide and Carbon Chemicals Corporation, 30 East 42nd St., New York, N. Y.

Mica in Aluminum Paint

Knowing the interest that your magazine has developed in the use of mica in paints, both pro and con, and having read the article published in your magazine last August (pages 18, 19, 20), giving the Aluminum Company's views against using mica in combination with aluminum, I am taking the liberty of sending you a copy of an article being sent to Jeffrey R. Stewart of the National Paint Bulletin, so that you may make some mention in your magazine of these new pigments, if you care to do so.

Mica has been incorporated beneficially with aluminum and overcomes all of the disadvantages usually set forth by Mr. Junius D. Edwards of the Aluminum Company of America.

The Somers Color & Paint Co., 41 E. 42nd St., N. Y. City, are starting to market all of the pigments referred to, and I believe it will be well for you to contact this firm . . . . —The English Mica Co.

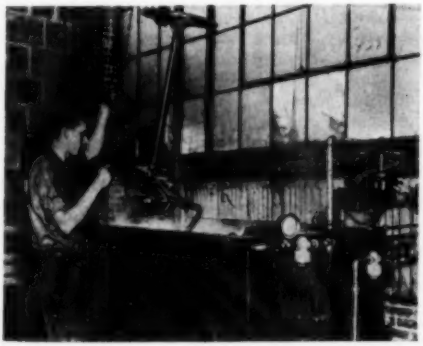
Metal Cleaning Methods

BY LOUIS NAGEL

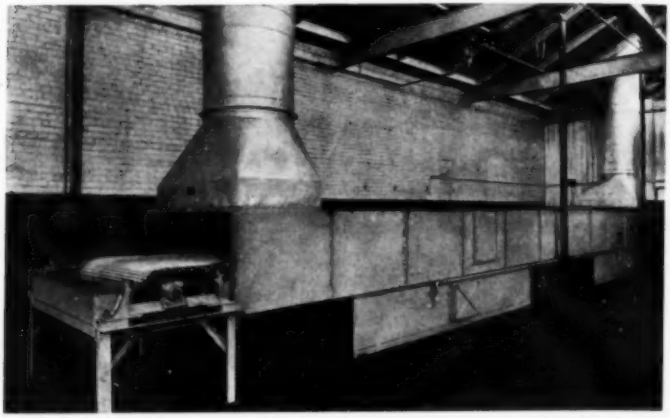
WHEN APPLYING paint onto iron or steel surfaces, a good rule to follow is: Put the paint onto the steel—not onto a layer of dust, rust or grease. This principle has long been conceded, and even in bygone days there were a few who took it seriously. In cases of obvious dirtiness, practically all metal finishers insisted upon the surfaces being cleaned, but often the operation was just "a good wiping off". A more careful artisan would resort to the naphtha wash or gasoline wash, which might be anything from a real wash in clean solvent to a hurried dunking in a tank of contaminated cleaning liquid.

In the old days the matter of metal cleaning was not taken so seriously—probably because then the subject was not so vitally important. Good oil-enamels and pitchy japans would tolerate some greasiness, and they still do. That's one reason why they are still important and useful. I have in mind a certain brand of air-drying black that was liked for its property of sticking, even to slightly greasy steel; by using it the manufacturer was able to avoid the bother of a thorough cleaning operation on his large assemblies.

When most paint jobs were applied with brushes, the brushing may have helped the paint to blend with and absorb the grease and dirt which were usually present. Brushing helped to work the paint into direct contact with the metal. But with spray application, it is different. The paint is sprayed onto the surface, and there it is. The dirty film, not having been displaced or disturbed, stays on the surface—under the paint—and, as a result, the paint crawls or eventually comes off. Often the failure is wrongly charged against the paint. We see then how the adoption of spray painting made it impossible to know more about cleaning metal surfaces.



Dipping heavy metal parts in tank of hot cleaning liquid.



This 2-stage washing machine has a mesh conveyor to carry small metal parts.

When lacquers came into extensive use they brought us a further cleaning worry. The early nitrocellulose coatings adhered none to well at best, and many a finisher, lacking confidence in his cleaning technique, resorted to use of a first-coater of the oil type; and more than one new lacquer user switched back to oil-varnish materials.

Workmen observed, probably while removing lacquer from their hands, the high solvency of lacquer thinners. Soon lacquer solvent washes were replacing, rightly or wrongly, naphtha baths. Lacquers of one sort or another had long been used by the electroplater, but as he put them onto newly-deposited plate, there was no cleaning problem involved. However, he did have considerable experience in cleaning metal before plating, and this experience was utilized by the painter who adapted it to his own problems.

Doubtless the vitreous enameler, too, contributed something with his blast-cleaning and tumble-cleaning methods. But for lacquer finishes, this type of metal cleaning was not as useful as for some of the thicker-coat finishes, such as wrinkle, hammerkraft and crystal.

Cleaning Plus Rustproofing

The advent of synthetic finishes made metal cleaning methods of further interest. Absolute cleanness was more closely approached —and even attained. On the cleaned metal there was generated a layer of metal compound, as by means of phosphoric acid and other acids. The artificially-generated surface compounds are not only adherent, stable, nonprogressive, and rust-preventing; they form characteristically-colored surface effects which accept all kinds of paint readily and evenly. These effects will not develop uniformly, however, unless the surface has been thoroughly

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Not a Revised Edition But a Completely New Book!

THE NEW 1939 CHEMICAL FORMULARY

VOLUME IV

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Over 600 pages containing thousands of practical formulae — many of which have never before been made public. One formula may be worth hundreds of dollars to you.

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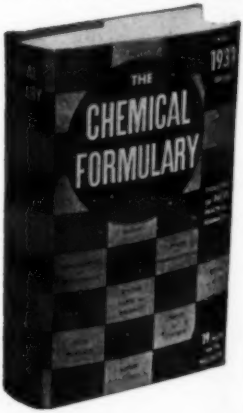

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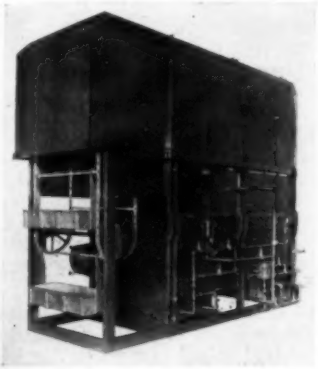
cleaned. Perhaps, then, part of their value is due to their serving as visible indicators of cleanness. A similarly-useful indicator of



Automatic degreasers used to clean metal stampings and various other small parts.

cleanliness is the electroplater's cyanide copper flash, for the color due to the plated copper occurs only where the metal is perfectly clean.

Vapor Degreasers

Another immersion cleaning method makes use of the vapor degreaser (immersion or spray) which is essentially a solvent-wash apparatus so contrived that the solvent is always clean. Inasmuch as its functioning depends on high-density non-flammable solvents, the process has the further advantage of being free from fire hazard. Not only can this device continuously provide clean solvent, but the latter can be presented in both vapor and liquid states and in at least two different temperatures, simultaneously. Also, the liquid may be used while quiescent or while issuing from high-velocity jets.

Every finisher should know about this useful apparatus and its possibilities and limitations. In some ambitious installations it is assigned a place in a more involved layout of surface cleaning equipment. For example, it may be followed by the aqueous alkali cleaning process, or preceded by an alkali stripper operation.

Burn-off Process

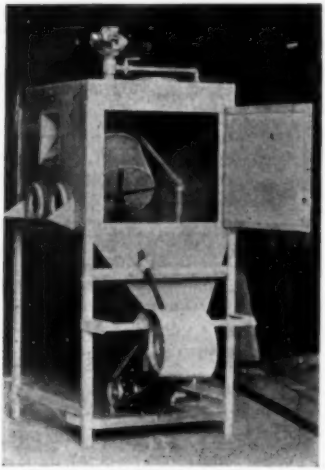
Paint may be burned off metal by heating it hot enough, and by this same method you can remove the organic part of the ever-present dirt. While the vapor degreaser takes off fats, hydrocarbons, and waxes, the burn-off operation removes these and more. It takes off all organic matter. But both tend to leave a residue of non-greasy ash, dust, and scale; hence both processes are well followed by wiping, brushing, sanding or scrubbing, or by an alkali cleaner.

On coming from the burn-off process, the metal surfaces may look unlike elemental metal, but as long as they take and hold paint evenly and permanently there would seem to be none but academic reasons for pondering over what has actually taken place. Parts that have a tendency to warp at the high temperature involved are unsuited to this operation. In other cases the surface condition produced by the heat aids the ensuing finish in a second way. Some experts assert, in connection with the japanning of brass and copper, that a preliminary high-bake makes possible the saving of one coat of finishing material.

Other Methods of Cleaning

We have here considered a number of methods — none perhaps entirely perfect, but each one having certain merits. They include aqueous, organic solvent, dry, and high-temperature procedures. The dry methods — the duster brush, airblast, sandblast, abrasive paper and cloth, and the tack rag—require no description here.

Solvent processes include methods suitable for use before assembly, as well as afterward. Thus the degreaser is restricted to products unattacked by the liquid employed. The simple solvent-wash treatment may be used either by dipping or by mopping. Among the solvents used for cleaning by the dipping or mopping method there are some in which may be dissolved substances having rust-consuming and rust-proofing properties.



A small cabinet-type, continuous-feed, automatic sandblast machine for cleaning metal parts preparatory to being finished. Parts are placed in removable wire-mesh basket which is rotated at a tilted angle under a sandblast nozzle in the cabinet.

The aqueous liquid (alkali and acid solutions) procedures commonly require complete immersion of the parts to be cleaned, hence they are limited in application to things that those solutions do not injure. These cleaning methods are often used on articles that are cleaned (and painted, too) before assembly. In case a pickling operation is included, it is advisable to have the painting operation follow as soon afterward as is practical, as rusting may begin at once, unless the treatment also included rustproofing.

There may be those to whom the selection of a cleaning method best suited to a particular job seems difficult, but if one will consider the above-listed methods in relation to his own product and plant, he can narrow down his choice to the type most suitable. And, by consulting prominent makers of cleaning equipment and materials, he can readily arrive at the best choice.

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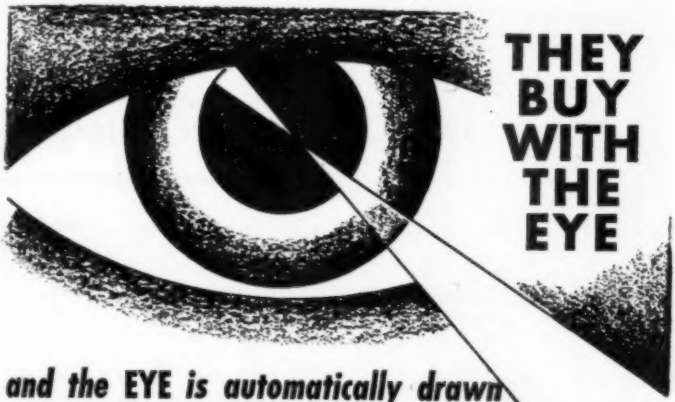

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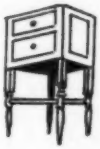
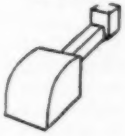


ON METAL



ON COMPOSITION

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Laboratory Furniture Finish

Recently we had correspondence with you about an article which appeared in your June issue, entitled "Chemically Resistant Finishes for Laboratory Furniture."

That article stated that a clear air-drying finishing material, for finishing the side of wood laboratory tables and desks which would stand quite a number of acid tests, had been produced, but in tracing this down from the information you gave us, we are in receipt of a letter from the manufacturer which virtually states that the right article has not as yet been brought about.

Now in your July issue there is an article on pages 30, 31, 32, 34 and 35, by Mr. R. L. Masterson, one part of which (second paragraph, second column, page 31) states that an acid-proof jet black chemically resistant finish on wood can be produced by spraying four or five coats of a very special chemical-resistant black enamel . . . . —S. A. Mfg. Co. (Laboratory Furniture).

The 2-part article, published in June and July issues of INDUSTRIAL FINISHING magazine, was prepared several months ago when some of the tests now included in P. W. A. specifications for laboratory furniture were not as severe as at present. The list of tests has been growing from month to month and the concentration of some of the testing materials such as phenol, has been increasing.

It is true that the chemical resistant varnish I referred to in my article is softened to some extent by ether, amyl acetate, acetone, benzol, and phenol, but the specifications permit softening of all of these materials, with the exception of the benzol and phenol. Probably this is due to the fact that there is some confusion as to whether benzol or naphtha is meant in the specification, as it was originally written, and also to the fact that originally the specification for the phenol test did not specify the concentration. The material I have in mind is affected in no way by any of the other solvents, acids, or alkalis included in the 16 different testing agents mentioned in the most recent P. W. A. specifications.

Recently I had occasion to examine and test two competitive finishing materials which, I understand, have been approved by independent testing laboratories and have been used on P. W. A. laboratory furniture. Neither of these materials is at all resistant to ether, amyl acetate, acetone, benzol, phenol, concentrated acetic acid, or concentrated sulphuric acid. While the material I wrote about is softened to some extent by the solvents, it hardens down again with scarcely any change in the appearance of the finish after the solvents have evaporated; but on the competitive materials the strong solvents act as a paint and varnish remover, wrinkling the finish badly and

Questions Answers

It Takes More Than *Smart* Lines

Many a woman possesses smart lines . . . a sleek, trim figure, yet she is not endowed with beauty. Finish . . . careful grooming with the proper cosmetics . . . must add the touches of comliness which complete the splendor of beauty.

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completely destroying its adhesion to the wood. Furthermore, the concentrated sulphuric acid completely eats through the finish and chars the wood; whereas, on the varnish I described, it leaves only a faint brown spot on the top of the finish. This can be removed with steelwool.

Some concerns, in trying out this chemical-resistant finish, have applied the coats too heavy and they were not sufficiently dry before tests were made. I suggest that where 3-coat work is to be done, the first coat is reduced equal parts with suitable reducer; and is allowed to dry 24 hours; the second coat should be reduced at the rate of 1¼ parts of varnish to one part of reducer, and dried 24 hours; the third coat should be reduced about 4 and 1 with reducer and should be dried for a week or 10 days before the tests are made.

These specifications are very strenuous and I doubt if there is any finishing material that will pass them 100 percent. In preparing the article for INDUSTRIAL FINISHING magazine, I plainly stated that this finish would be softened by some of the stronger solvents, and pointed out that the specifications permitted softening. —R. L. MASTERSON.

Briar Wood Pipes

Can you give me information on the finishing of briar-wood pipe bowls?—G. B. Co. (Lighting Fixtures).

The Editor of INDUSTRIAL FINISHING has written me in regard to your inquiry on the matter of finishing briar wood pipes. At the moment, I am preparing an article for INDUSTRIAL FINISHING on this very subject and I expect it will be published in an early issue. While I may refer you to that article for a brief but fairly complete resume of the practices current in the industry, I shall be very glad indeed to offer all the information I can.

In the U. S. A., briar pipes are finished in two major ways: 1) By shellac polishing, which is a version of the old familiar French polishing method, wherein the pipe is rubbed very rapidly on a loose cloth buffing wheel, the shellac and an accompanying wax being applied to the wheel in stick form, or to the work as a liquid. 2) By the spray application of two coats of a special cellulose lacquer, followed by a buffing.

The lacquer finish is undoubtedly much more popular due to its better retention of appearance. The shellac finished pipe has a tendency to dull down from handling and the heat of use. Oddly enough, the shellac finish, while less expensive, is applied almost universally to the more expensive pipes, makers of such merchandise feeling that the glossy lacquer finish detracts from the conservative richness of the product. A similar feeling is held by the makers of fine guns who adhere to the oiled finish on the stocks, in the face of strong tendencies toward varnish and lacquers for the purpose.

Pipe manufacturers in general are reluctant to release information on just how they prepare their stains and polishes—to such extent that lacquer manufacturers who supply them with materials often know but little of the details of processes not directly

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concerning their own materials. I cannot, at the moment, give you an exact formula for the shellac polishing process though I may be able to do this later.

The lacquering process, which may be more to the point for your purpose, is relatively simple. The lacquers are low-solids cellulose materials of quite high viscosity. The solvents are high-boiling, allowing for a smooth flow. Two full wet coats are usually applied, with a forced drying of 4 to 8 minutes at temperatures of 100° to 120°F. After cooling, and usually after a curing period of about 24 hours, the pipes are buffed to a high polish on a loose muslin wheel with the use of a compound similar to that used by metal platers, called "lime white" or "white finish."

The smoothly-sanded pipes are stained in a dip operation, usually with a spirit or so-called "non-grain-raising stain," and then wiped off with a cloth saturated with alcohol to relieve any possible tendency of the concentrated stain toward "bronzing," and to bring out the highlights of the wood texture. Various tricks of bringing out the striking figure in this wood are employed, such as a preliminary staining with a bright toner and following with a darker overtone stain, or by cutting the stain practically all off the pipe on a wheel treated with a cutting compound, to produce a natural effect with the grain outlined by the residual stain.

Much of the lacquering is now done on automatic machines which apply two coats to the pipes (force drying each) with one operator, at a rate of about 14000 per 8-hour day.—W. T. SMITH.

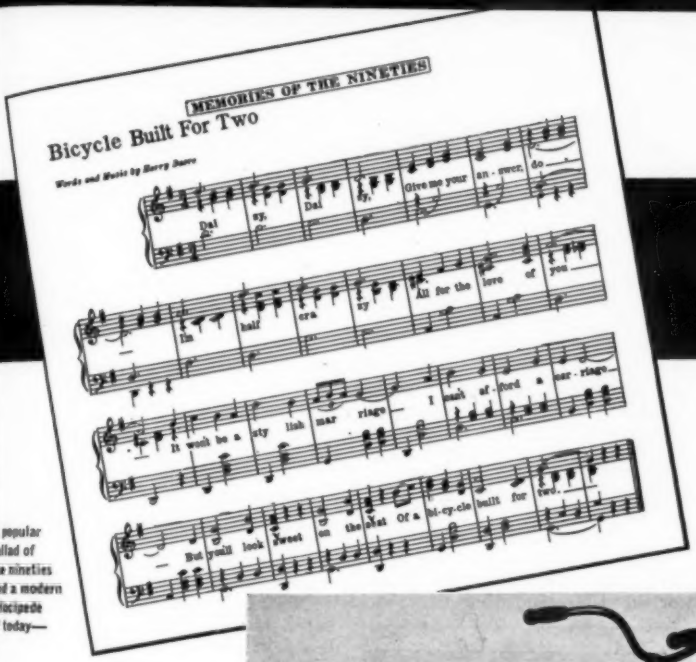
Cherry Cupboard

What's the proper way to apply an aged finish on a cherry hanging wall cupboard, so it will look like a 17th Century piece?—B. H. Co.

To give an intelligent answer to this question, a finisher needs more information about the present condition of the cabinet. However, I will assume that it is new and "in the white". In that case, I suggest using a wiping stain made from burnt sienna concentrated wiping stain and raw sienna concentrated wiping stain, reduced with a good grade of Oleum spirits or Varsol or Stainsol. Prepare the stain by mixing two parts of burnt sienna concentrated wiping stain with one part of raw sienna concentrated wiping stain. Then reduce this mixture in the proportion of one part of stain to three parts of thinner. If it still seems to be too thick or heavy, reduce it a little more to make a light-bodied free-flowing stain.

Before applying the stain to make the pieces appear aged, you might make a few scratches and bruises in the door frames or other parts where it is possible that such scars might occur in actual service. Or, instead of actually making these scratches and bruises, you can simulate them later with markings which you can make with a small slender brush dipped in spirit stain that is somewhat darker than the general color of the cabinet. These markings should be applied after the first coat of all-over stain.

Getting back to the regular all-over stain, which you have applied, wipe off the surplus stain clean, wiping with the grain of


MEMORIES OF THE NINETIES
Bicycle Built For Two
Words and Music by Harry Dacre
Dai sy, Dai sy, Give me your an - swer, do —
In half cra zy All for the love of you —
It won't be a sty lish mar riage — I can't af ford a car - riage
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the wood. When I say "clean", I mean to leave parts outside of the cupboard light enough to permit of highlighting those areas where wear from long usage might tend to have worn off the original color.

Allow the stained surface to dry at least four hours, or better, overnight. Then apply a thin coat of white shellac, using about one part of 3½-lb. or 4-lb. cut shellac to eight parts of denatured alcohol. Or, lacquer can be used in place of shellac, reducing the lacquer in the proportion of one part of lacquer to eight parts of lacquer thinner. Allow this coating to dry two hours. Sand lightly with No. 6/0 or 7/0 finishing paper. Then finish the antiquing by brushing or spraying on a coat of the same kind of wiping stain as first used—or thin it out until a color is made that can be left on the parts that are to be the darkest, and still be transparent enough to reveal the natural wood grain. Allow this glaze to dry only long enough to take a slight hold on the wash coat. Wipe out certain parts to make them look worn, blending edges of the color off gradually with a soft cloth or soft brush. If any parts do not come right at your first attempt, this glaze can be washed off with Oleum spirits or naphtha and done over without injury to the first stain or wash coat of shellac.

French Provincial group made of butternut wood, finished to retain the soft, warm beauty of the wood and closely resemble the old fruitwood from which the cabinet-makers of the French provinces carved their original masterpieces. A product of Landstrom Furniture Corp., shown at the American Furniture Mart.

Allow the glaze to dry 30 minutes or longer. Then it can be coated over with a medium gloss flat lacquer, or white shellac reduced about four parts shellac (4-lb. cut) to one part of denatured alcohol. I suggest two coats of either material. Allow two hours or more for drying between coats. After an overnight drying, sand with No. 6/0 or 7/0 finishing paper, steelwool (No. 4/0) and wax. The shellac or lacquer finish coats can also be rubbed with oil and pumice stone (2F or 3F). The final finish should not be a high gloss, but a soft satin sheen.

Cherry wood comes from the black cherry which grows in scattered areas extending from Maine to eastern North Dakota, and south to Central Florida and Central Texas. It is scattered sparsely throughout the forests. The wood is strong and moderately hard and of very moderate shrinkage. The heartwood varies in color from light to dark reddish brown; sapwood is narrow and nearly white. Cherry is very good for paneling and furniture.—OWEN MYERS.

Day's Enamels are made in all types — lacquer, varnish, synthetic, spirit. They are made for application by spraying, dipping, rolling, screening, tumbling and brushing. No matter what your enamel requirements are, there is a Day product that will give you a more attractive and more economical finish.

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"Quix" Rubbing Compound

The McAleer Mfg. Co., Detroit, Mich., recently announced a new rubbing compound, "Quix," for enamel and lacquer finishes. It is a companion product for their Speedie-Rub which is well-known to automotive finishing craftsmen for many years.

The new product has been developed specifically to meet the requirements of finishers and refinishers who want a product in the lower price field—and yet a product of known quality and uniformity. Low price has been made possible by the company's tremendous volume. "Quix" is handled through regular jobber channels.

Vitra-Carlite Clear

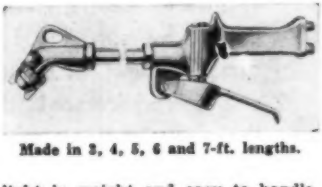
Hilo Varnish Corporation, 44 Stewart Ave., Brooklyn, N. Y., announces release of Vitra-Carlite Clear. Actual tests show a one dip, baked at 250° F. for one hour, produces a beautiful finish with practically no discoloration of the metal. The finish offers real possibilities for all kinds of dip work, enameled metal and wood, and on bright metal parts which are subjected to considerable heat inside or out. The wood handle trade now using Vitra-Carlite Clear over colored enamels to give added luster, toughness and surface hardness.

Extension Spray Gun

Binks Mfg. Co., 3114 Carroll Ave., Chicago, Ill., has just announced the production of a complete one-piece streamlined extension spray gun, known as the "Thor Model No. 23 Spray Gun."

This new extension gun was designed primarily to allow the operator to apply paint directly to surfaces that are usually out of reach of an ordinary spray gun—for applying paint on interior walls, ceilings, truss work, girders and similar applications.

Made of special alloy metal, the new Thor No. 23 is exceptionally



Made in 3, 4, 5, 6 and 7-ft. lengths.

light in weight and easy to handle. All parts are carefully encased to prevent damage in handling. A conveniently-placed knurled screw, directly behind the nozzle head, controls the width of the spray.

New... MATERIALS SUPPLIES EQUIPMENT

H. T. A. Zaponite

(High Temperature Application)

H. T. A. Zaponite, announced by the Zapon Division of the Atlas Powder Co., Stamford, Conn. (and Zapon-Brevolite, North Chicago, Ill.) is a one-coat furniture finish that is heated and sprayed at a temperature of 170° to 180°F. at the spray gun nozzle. Its purpose is to provide a high-quality durable finish, and to accomplish in one coat what formerly required three coats of material. Even the usual sealer coat is dispensed with.

The material is applied in a single spray application (sometimes in one pass of the spray gun; sometimes in two successive passes) to give a full

rubbing body. The finish is anchored directly to the wood and it is highly resistant to scratches or mars. Being light in color it can be used on the lightest colored woods. Production schedules can be reduced to four or five hours between spray gun and rubbing deck.

Owing to the extreme toughness and durability of the film produced, this finish is somewhat more difficult to rub down by ordinary conventional methods, but by modifying the customary rubbing methods in directions developed by Zapon, this factor has been brought into line satisfactorily.

According to the manufacturer, the most remarkable quality of the H. T. A. Zaponite formulation is its ability to produce a full-depth finish, using half as much solids as were formerly necessary. The material may be applied directly from the shipping drum or through the present distributing system. A specially designed circulating heat unit is put into the line to heat the material for hot spraying. This heating apparatus was designed in collaboration with Zapon technicians.

After the single application (one or two passes) the finished surfaces are allowed to air-dry for one-half hour. The work is then placed in a dry kiln for two hours, where it is force dried at temperatures varying from 125° to 140°F. Humidity control is not essential to properly cure this new finish. Upon removal from the kiln, the finished products are allowed to cool for one-half hour, after which they are ready for rubbing and polishing.

This new finish is available in gloss, semi-gloss and flat sheens. The full gloss finish is generally applied where the surface is to be rubbed and polished. Upon completion of these operations the finished products may be packed immediately, with assurance that there will be no shrinkage or "printing" of the film afterward. This finish will pass a pressure print test at temperatures up to 150°F. No soap

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or stearates are used in the formulation of the flat finishes, therefore these materials have outstanding brilliance and clarity.

Summing up the merits of H. T. A. Zaponite, as claimed by the manufacturer: 1) one coat of finish instead of three; 2) the one coat requires only 1½ times as much material as an ordinary single coat of finish sprayed cold, therefore the final saving in material (one coat versus three coats) amounts to about 50%; 3) single coat application requires less labor, less time, less space; 4) finishing time shortened about 75%; 5) clarity, print resistance and durability are particularly outstanding.

Turntable Reclaims Overspray

The American lacquer reclaimer is a galvanized sheet-metal turntable for spray booths—built in the form of a shallow circular pan with a wire mesh deck to support products being sprayed. When in service the circular pan is partially filled with thin lacquer of the same kind and color as that being sprayed. Due to chemical action, the lacquer in the turntable pan attracts the vapor from the lacquer being sprayed, and reclaims a certain percent of it by actual test.

In the hand spraying of industrial products there is always a certain percentage of overspray. With the lacquer reclaimer in service, most of this overspray is caught in the pan and may be used again, because the thinner in the drum keeps it solvent. The reclaimed lacquer is drawn from the pan through a drain cock and, after being emptied into a container, it is ready to use again as soon as it is reduced to the proper viscosity.

A saving in labor is effected because the spray operator is not obliged to be continually replacing paper on an old style turntable and on the floor to catch the overspray. With no lacquer or paint dripping around the floor from temporary paper shields, the fire hazard resulting therefrom is eliminated, as well as the danger from accidents on floors made slippery by being covered with waste material. The health angle is also important inasmuch as most of

The turntable is a shallow pan containing thinner, and covered with wire mesh.

the vapor that menaces the operator's health is now absorbed by the similar liquid in the turntable pan.

In case an article is to receive a combination finish which will require the spraying of two different materials, another turntable pan can be placed on top of the first one. Another wire mesh screen is placed over the top of the second pan and the product being finished is placed on this second screen and sprayed as usual. When not in service the top of the pan is covered with a close fitting lid.

In the American Wood Carving Co.'s factory at Chicago, where six booths have already been equipped with this device, it is meeting every requirement and proving to be highly satisfactory. Patents have been applied for the device which is

HERE it is!

cannot be marred or scratched

A lacquer finish that cannot be marred or scratched with the thumbnail, or other destructive agencies — a much tougher piece of goods than the ordinary lacquers. It produces a splendid transparent finish of full depth on maple, walnut, gum, mahogany and other cabinet woods... It is made in either the Clear Gloss Rubbing or the Satin Finish. Mar Proof Lacquer Sealer is recommended for the first coat.

Send for FREE WORKING SAMPLES

THE SCHAEFER VARNISH COMPANY, Inc.
Louisville — — Kentucky

an invention of Paul Karowsky, Vice President of the American Wood Carving Co. According to present plans it is to be marketed by Mr. W. C. Westfall, a Chicago machinery salesman.

Cellophane Flock

Flock fibers have been supplemented, in the past year, with another cut material which is arousing considerable interest in the trade. After considerable development work the DuPont people patented the new product—Cut Cellophane. They licensed the Rayon Processing Co. of Central Falls, R. I., on this item, giving them sole rights to cutting and marketing this material for decorative effects as Cellophane Spangles. The material may be obtained in white or colors, and in various cuts ranging from No. 8 to No. 80, the No. 8 being coarse, and No. 80 fine.

Various uses are being found for this material, which might be itemized as: 1) Overall coating for paper; 2) overall coating for figures and pieces; 3) stencil work for paper and fabrics.

On these uses the cellophane furnishes an effect similar to flitters. It has a glitter and sparkle, and with the proper bonding agents it has good anchorage.

There have been suggested, as possible uses for this novel material, the following:

1) Manufacture of signs.

2) Decorative effects on panels using resin as a binder, and molding the coated pieces.

3) Protective coating, using liquid binder for any perishable and fragile materials.

The material may be obtained for experimental purposes, and there is reason to believe that research and sales departments will show future interest in this new kind of flock.

Put that Striking Finish On!

CLAREMONT FLOCKS

COTTON — WOOL
RAYON

Any article sprayed with CLAREMONT cotton, wool or rayon flocks is so much more attractive that it commands a better price and sells faster — yet the cost is increased less than the mark-up that can be made for improved appearance of the article.

Used on

SIGNS — DISPLAYS
MIRRORS — NOVELTIES
BOXES — WIRE PRODUCTS
CLOTH — PAPER

— for best results use the best flocks made.

Write for Samples.

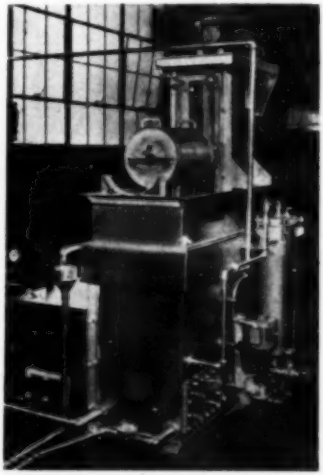
CLAREMONT WASTE MFG. CO.
CLAREMONT, N. H.

The country's largest manufacturers

One-Dip Degreaser with Rotating Baskets

An important new development in which degreasing can be applied to cup-shaped work, is effected through the rotating-basket design of a Detrex degreaser recently developed by Detroit Rex Products Co., 13005 Hillview Ave., Detroit, Mich.

The company claims substantial economies in the cleaning of cup-shaped work by this new rotating-basket design. It is used on work



One-dip, rotating basket design of Detrex Degreaser, equipped with continuous filter and continuous Detrex Solvent Still. This view is from the loading-unloading station, and shows the formed rest for quickly placing and centering basket of work on driven spindle.

which would otherwise tend to trap solvent and cause a heavy carryout. Work comes from the degreaser clean, warm, and dry-free from the last trace of solvent vapors, chips and abrasive. Engineering balance of heat input against production, together with high capacity water jacket condenser and other features,

which maintain the vapor line at the midpoint of the condenser, have effected further cleaning economies.

This degreaser consists essentially of a one-dip or liquid-vapor design with storage tank and a special automatic elevator mechanism which raises and lowers the rotating baskets. A continuous filter is used to keep the boiling chamber free of insoluble material, and a continuous operating solvent still is used to remove oil contamination. By this means the work is always immersed into clean solvent and a final pure-vapor cleaning action is given as the work is raised out of the boiling solution. A clean solvent storage tank is located at the rear side of degreaser.

The drum-shaped mesh basket with which this machine is equipped for rotating and draining the work, fits over a spindle which is attached to the elevator mechanism and has a gear and pinion device to cause rotation of the basket during its descending and ascending travel. A push-button station located adjacent the loading end operates the elevator drive mechanism, while limit switches and a time interval control govern the travel of the elevator and basket. After the set time interval for cleaning in the boiling solution, the load returns automatically to the loading-unloading station.

UltraKote Synthetic

UltraKote Synthetic—a finish announced by C. W. Haynes Laboratories, Inc., Springfield, Mass.—can be used on any production metal, ranging from the manufacture of delicate jewelry to heavy machinery, including the following: Metal kitchen cabinets, stoves, refrigerators, ironers, washing machines, flashlights, clocks, office machine equipment, lamps, locks, and bathroom fixtures.

It provides a hard chip-proof surface having the appearance of porcelain and is much tougher, thus saving the shipper's headache—chipped

FORM-A-ROC

We offer to all industries equipped for baking finishes this highly perfected, heat-converting, synthetic enamel.

FORM-A-ROC

We have combined to an optimum degree the necessary qualities of tremendous hardness, great adhesion, smooth lustrous gloss, and freedom from haze, discoloration and wrinkling.

FORM-A-ROC

Baking schedule is of great flexibility, permitting from 5-50 minutes at 250-375° F.

FORM-A-ROC

No matter which of the present worthy finishes of this type you may be using or planning to use we sincerely recommend that you investigate

FORM-A-ROC

MADE BY

THE VARNISH PRODUCTS CO.

5208 Harvard Avenue

CLEVELAND, O.

merchandise. It can be applied by the spray, dip or roller coat machine. Its flexibility is demonstrated by the fact that a metal panel finished in UltraKote Synthetic can be bent double. When applied to casting, a specially designed undercoat can be baked in one operation with the top-coat, instead of the usual two baking schedules.

It is available in water-white clear or in any color. The clear is really water-white and non-yellowing, and the whites will actually withstand elevated temperatures. Its quick baking time at low temperatures represents a substantial saving.

Fast-Drying Aluminum

The industrial department of Red Spot Paint & Varnish Co., Evansville, Ind., informs us that they have developed an extremely fast-drying aluminum paint. According to their announcement, "this new product dries as fast as lacquer but has the leafing properties of the high-grade varnish bronzing liquid. It has an unusually bright finish—one which will resist extreme humidity-cabinet tests as well as excellent weathering properties; especially adapted for one-coat metal work where a high-solids material, giving great build but at a very low viscosity, is desired."

METALPREP
"Used First, Makes Your Paint Finish Last"

- REMOVES Rust, Oil and Grease
- ETCHES the Metal
- MAKES Paint Adhere

The complete metal cleaner for all sheet metal surfaces. Provides a firm bond and insures long life to finish coats. Used on more than ten million units.

Write for Literature Today

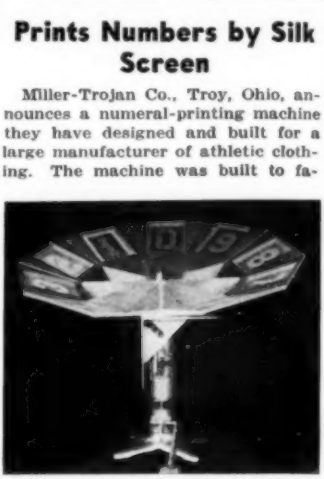
Neilson Chemical Co.

6564 BENSON ST. DETROIT, MICH.

Australian Representatives:
Hardie Trading Pty., Ltd., Melbourne

Prints Numbers by Silk Screen

Miller-Trojan Co., Troy, Ohio, announces a numeral-printing machine they have designed and built for a large manufacturer of athletic clothing. The machine was built to facilitate the numbering of players' shirts or any other type of athletic clothing by the silk screen process. In the past the numbering of this clothing has required 297 screens to do the same work this machine will do with 30. Also, it was necessary to wash each screen after it had been used. With this machine it is necessary to wash the screens only when the number size is changed, or when the color of paint or dye is changed, or if the machine is left idle for some time.



The revolving "head" carries silk screen stencils for printing different numerals.

The head, or printing surface, revolves and it is only necessary to turn to the desired number, step on the pedal and squeegee the paint or dye in the regular manner. The head sets in two different positions; one is "down" in the printing position, and the other is an upright position. This latter position allows the operator plenty of space for placing the product on the machine before printing, and then removing it after the print is made.

The table turns, which eliminates the possibilities of smearing the

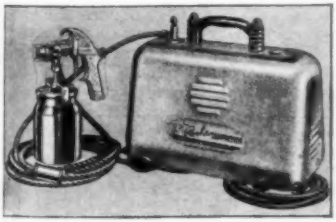
paint. This is due to the fact that after one number is printed the table is turned, which turns down that surface and brings up another. It is so designed that different size numerals can be used and these numerals can be spaced different distance apart. The machine is equipped to print 4, 6 and 8-in. numerals at a speed not possible with the old method. It is also possible to print other size numerals if different screens are made.

Joint-Sealing Compound

"Titeseal" is a flexible, non-hardening gasket and joint-sealing compound which seals against water, steam, gas, oil, grease, anti-freeze leaks. It may be used as a gasket where tolerance permits, with gaskets, as a threaded joint dressing, as a filler with packings, as a special insulation material, as a rust and corrosion preventive. It is non-solvent and heat-proof, and allows easy disassembly as it never hardens. It is unaffected by heat, cold, or extreme fluctuations in temperature. It will never dry out. . . . a product of Radiator Specialty Co., Charlotte, N. C.

Portable Spray Unit Cooled

Binks Mfg. Co., 3114 Carroll Ave., Chicago, Ill., announces a portable spray unit of streamlined design,



Safe, light, cool, efficient.

A GOLD SILVER or COPPER *finish*
will improve your product
High in Quality Low in Cost
Request samples today
The Mitchell-Mayer Co.
ST. LOUIS, MO.

GRAINING PLATES
bring out the QUALITY *you have built in*
YOUR PRODUCT
AMERICAN ELECTROTYPE COMPANY
104 E. MASON ST.
MILWAUKEE, WIS.

with forced draft cooling. The entire compressor unit is enclosed in a heavy metal case, hence the danger of accidents to workmen or the public is done away with entirely. Children can play in the same room with the decorators and be completely free from danger of being hurt by open belts. The unit itself is safeguarded from damage and its useful life is prolonged by this protecting cover. It is powered with a G. E. universal motor. The over-all weight is around 40-lbs. and a single handle on the top of the unit permits easy handling.

Two powerful fans set up a tremendous suction and blowing system within the confines of the enclosed metal case. The scientific placement of intake and exhaust vents permits the entrance of a cooling air and does not allow this air to escape until it has passed completely around all parts of the unit . . . . a constant temperature is assured.

Propeller-Type Blower

A new propeller-type fan blower, with the motor located on top of the blower housing, entirely out of the air stream, has just been announced by the Hartzell Propeller Fan Co., Piqua, Ohio.

Construction of the unit is simple and sturdy. The motor is mounted on top of the blower housing. One side of the platform on which it rests is hinged, and lock bolts on the opposite side can be loosened to tighten or loosen the belt, or to change it. A V-belt transmits power from motor to fan shaft, and this belt can be replaced from outside of the blower. The belt is protected inside

View of typical installation

the blower by a steel guard. The entire unit is patented, and the patented Charavay Tear-Drop propellers are incorporated. It is claimed that these propellers represent a new advance in propeller-type fan operation, in that they give high air deliveries against heavy back pressure.

The new blower is delivered complete with housing, and can be installed with minimum labor in any existing duct. It is made in 12 standard sizes, with propellers from 18 to 48-in. in length, and can be built in other sizes to meet special needs.

Rust Preventative

Rust preventative aluminum paints, announced by The Wilbur & Williams Co., Park Square Bldg., Boston, Mass., are claimed to have the folowing merits: Paint right over rust; stop more rust from bleeding through; paint over damp

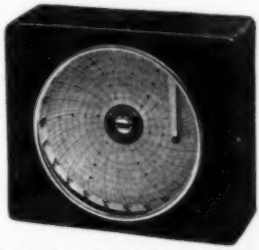
OVENS • DRYERS • FURNACES
ACCURATE CONTROL
WRITE FOR DETAILS
Ferro Enamel Corporation • 4150 E. 56th St. • Cleveland, Ohio

or dry surfaces; reflect over 71% of light; each particle of aluminum is coated by a special process to keep its brightness a long time without tarnishing; stand up to over 600°F. heat; cover from 700 to 1100-sq.ft. on the average surface; excellent for wood because of their penetrating and preserving qualities; can be sprayed or brushed.

"Totrust" is the vehicle used in "Totalume" rust preventative aluminum paint, and may be had in black, red, olive green or clear. The clear is used only as an undercoat for extreme thicknesses of rust. Totrust covers from 1000 to 1800-sq.ft. of surface per gallon, and in the clear state it can be used as a vehicle for red lead, giving great durability.

Recording Thermometer

A small compact portable recording thermometer of high quality construction and accuracy is offered by the James P. Marsh Corp., 2073



Weight, less than 2-lbs.; 2½x5x6-in.

Southport Ave., Chicago, Ill. The measuring elements are accurately made and thoroughly tested. The chart is rotated by an accurate fully adjustable clock movement, wound by a convenient knob extending through the back of the case.

The pen and pen arm were specially developed for the "Serviceman" Recorder. The arm has a friction hinge which permits it to be swung clear of the chart for quick and con-

FLOCK

For New Popular Finishes

RAYON:

"Raycote"
(Patented No. 2014947)
"Raymix"

COTTON:

"Kingcote"

CELLOPHANE:

"Spangles"
(Patented No. 1802547)

Rayon Processing Co.
861 Tremont St.
CENTRAL FALLS, R. I.

SHEL-MATIC 45

The **Modern Spray Gun**

Fully enclosed chassis. Feather-touch trigger . . Automatic needle release . . Exclusive straight-line valve action . . Anti-friction spray head . . Easily handled . . Simply adjusted . . Quickly, easily cleaned . . Reduces material waste . . Light, but rugged.

A. SHELBURNE COMPANY
739 SERES AVENUE, LOS ANGELES
★ *Complete Automotive and Industrial Spray Equipment* ★

venient chart replacement. A particularly clean, sharp record is traced by the specially designed pen. A pointer on the dial enables the operator to set the chart at the proper time. The case is smooth cast aluminum, handsomely finished in satin black, with highly polished chrome bezel. An accurately fitted hinged door forms the front of the instrument. It is easily opened for changing charts, and is dust-tight when closed.

The instrument comes packed in a durable hinged container which also contains a supply of charts and ink. If desired, a leather carrying case is available.

Lacquer Retarder

A new retarder to prevent blushing or blooming of nitrocellulose lacquers during drying on damp humid days has been announced by The Enthone Co., 444 Elm St., New Haven, Conn. It is claimed that this retarder will overcome blushing troubles during days of high humidity for all types of nitrocellulose lacquers applied by spraying, brushing or dipping. The retarder is said to have wide resin tolerance and high nitrocellulose solvency, thus making it compatible with almost all lacquers.

Plant and laboratory trials, it is claimed, have shown that the retarder does not unduly slow up the drying time. Tests of lacquers dried during periods of high humidity have demonstrated that considerably higher film strength and adhesion of the lacquers were obtained when the retarder was used.

MAGIC TACK RAGS remove specks, lint and sand particles--- bring out that deep, smooth luster, produce a faultless surface for white or colored finish. Why use "home made" tack rags when you can buy MAGIC TACK RAGS at trifling cost! They are tackier, do not dry--- are dust-proof and spontaneous combustion proof. Packed in dozen and gross lots or more. Made only by the

Wm. A. Juergens Co.
4036-40 Lagrange Street,
Toledo, Ohio, U. S. A.
If your dealer does not carry Magic Tack Rags, write us for sample.

Spraying Unit for Hot Lacquer

The M. & E. Mfg. Co., Indianapolis, Ind., announces a new mechanical unit for spraying hot lacquer. It is complete, ready to attach to user's present equipment for spray-painting.

Both pressure and temperature are adjustable, giving a complete range from 5-lbs. to 40-lbs. pressure, and from 100° F. to 190° F. temperature. Temperature is maintained by an adjustable thermostat which can be set at the pressure wanted. It remains constant until a different temperature is required.

A carefully designed circulating pump, driven by an explosion-proof motor, maintains three times the amount of fluid required by the largest spray gun, in circulation constantly, assuring steady performance at all times. The unit is made to operate on any electric service available. It is sold with a positive guarantee of satisfactory, trouble-free and continuous service.

Industrial FINISHING

Distributed to Executives and Foremen Finishers in industrial plants where finishing coats are applied with finishing equipment.

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EDITORIAL

Are Workmen Important? Look!

One of our friends—a man who operates a small manufacturing establishment — complained that one of his men recently poured the wrong kind of thinner into $18.00 worth of lacquer and ruined the entire batch. Of course, this mishap and expensive wastage of material were unfortunate, but it is just another of those incidents which remind us that workmen are important.

It isn't enough to spend money on plant equipment, materials, supplies, product development, product marketing, advertising, etc. There is the human element of every one of the personnel, to consider. Workmen and foremen of reasonable intelligence and energy, who have been with the company a number of years and have become trained in knowledge and skill to handle their work satisfactorily, represent a really valuable asset to any manufacturer. Indifference to labor's importance is costly in many different ways, resulting in frequent labor turnover, disorganization, slow production, costly mistakes, excessive wastage, accidents, and unprofitable operation in general. It is common knowledge that ruthless agitators and racketeers recognize this importance and use it to their own selfish advantage.

Use That Better Finish! Consumers Prefer It

★ Too many furniture manufacturers are prone to sacrifice the wearing qualities of their finish. At least this is the opinion of a very successful retail furniture dealer. He ascribes his success to visits at the home six to twelve months after a sale is made. He inquires if they are satisfied, and also asks if they have purchased furniture from other sources and if it is giving satisfaction.

Almost all complaints pertain to the wearing qualities of finishes and fabrics. This is an in-

*Guest Editorial .... Many readers can write an excellent editorial — two or three paragraphs presenting a timely suggestion or valuable idea that will stimulate thought on a live subject. The Editor welcomes guest editorials and pays for those that are published.

dictment, not of the manufacturer of finishing materials, but of the user of those finishes. All reputable manufacturers of finishing materials can supply any quality desired and can definitely advise the user about the comparative results. But too many furniture manufacturers, according to this particular dealer, stress the cost of a better finish entirely out of proportion to its intrinsic value.

Inasmuch as the complete cost of a piece of furniture seldom includes more than 5% to 7% for even the best of finishing materials, and since the better finishes will render 2-fold and 3-fold service, it is apparent that the durable finishes should be used exclusively. It is possible that furniture manufacturers overlook this fact because they do not have direct contact with ultimate consumers.

Manufacturers of electric refrigerators and ranges are applying finishes that will outlast the article itself. These finishes, of course, cannot be applied to wood products, but wood finishes are available which are far superior in lasting qualities to anything of the past. Business success is dependent on customer satisfaction and certainly nothing will cause more dissatisfaction than a finish that disintegrates rapidly or can not withstand reasonable usage.

It is easy to lose what you have gained
By prodigious effort of might and main;
Harder still to start anew
And customers trade and goodwill pursue.

—T. J. PIRRUNG.

This workman is flame-descaling an 18,000-lb. steel casting for a hydraulic turbine—an item too large to be easily and quickly cleaned by other methods. The process is based on the principle that when a high-temperature quick heating is applied to the scale (or oxide skin) on a piece of cold metal, the scale expands and breaks away from the base metal because of differential expansion between the scale and the steel. (Photograph, The Linde Air Products Co.)

Clean Cool Air for Better Spraying Results

Several different devices have been designed and placed in operation for removing oil, moisture and foreign matter from compressed air. Some operate on one principle and others on another, but those that give attention to the removal of heat that is generated in compressing the air seem to be gaining in popularity among practical engineers and finishers. In fact, some concerns now use an "aftercooler" through which the air passes after leaving the air receiver tank. Heat is removed from the air in this device. As a result, the compressed air loses its high affinity for oil and water, and when it passes through the separators a little farther down the line, it is more completely cleaned of all condensation and oil.

Oil in the compressed air comes from the lubricated piston rings and cylinders of the compressor. With this thought as a

background, and with the knowledge that oil in the air is a thing to be avoided, one manufacturer of compressors has designed a machine in which the piston rings need no oil or grease lubrication. The rings are made of carbon. Also, the cylinder stuffing boxes are fitted with a carbon glaze packing which eliminates the necessity for lubrication at the stuffing box. This manufacturer claims that since no oil enters the cylinder there will be none in the compressed air — which is an interesting proposition to users of spray guns.

Clinging to a Pet Idea

It is always commendable when a man develops and places in service an improved method of getting things done. In fact this is the way we make progress. Man's resourcefulness is continually taxed to work out methods of manufacturing products more economically, more rapidly, and in better quality. In the smaller establishments exceptional resourcefulness is often needed in order to make operations profitable without using the more elaborate and costly things which the concern can't afford to buy. However, the results of some men's inventive genius are not always strictly profitable when everything is figured into the costs.

Modern competition demands that the merits of every production method, material, or item of equipment shall be judged strictly on the basis of its ultimate showing on the cost books. Unfortunately, some foremen and higher executives will insist upon continuing the use of a method or piece of equipment because perhaps it is their pet idea—one they developed, or selected, or were sold on. They are reluctant to change to anything else. This one thing—call it what you will—is responsible for holding back certain departments, or the profitable manufacture of certain products in many establishments.

Progressive men realize that every production method and piece of equipment will be eventually replaced by something better, or discontinued because the need for it no longer exists. Its real profitable usefulness may last for only a week, or a month, or a year. Whoever is responsible for results in the plant should be alert to find and adopt something better as soon as possible—if and when something else will be more profitable — regardless of whose idea it is to be improved, discarded, replaced or adopted.

Letters from I. F. Readers

(Continued from page 8)

sidering trying it, because he felt sure it would not harm the dog, and it might do him some good! Another man who had a subterranean mushroom culture farm requested the reaction of cedar on the wood frames and other partitions he had to use in a damp and moist atmosphere. He was interested to know if it would avoid rot and keep the timbers from decaying.

It is rather hard to answer these unusual and isolated problems be-

Special Wood Bleach Offer

1 quart Ken-Wood Decolorant
1 quart Ken-Wood Aspen Concentrate

— $2.00 —

If cash is sent with order, shipment prepaid anywhere in U. S. A.

(Jobbers please inquire for prices. Available in quarts, gallons and carboys.)

Kenneth O'Meara, Holland, Mich.

cause in many instances we ourselves do not know. So many inquiries put us in the class with the chap who when he became sick, yelled for a horse doctor!

"A horse doctor?" his friends inquired. "Why a Veterinarian? Why not a regular doctor?"

"Well," replied the sick man, "it's this way. When they call in a horse doctor, the horse tells him nothing. He's got to know!"—Sparhawk Co.

Pyrax; Dicalite

In the December issue of INDUSTRIAL FINISHING (page 17) you had a description of two new materials, namely: Pyrax, a filler, and Dicalite. We would appreciate receiving the manufacturers' names and addresses. —D. H. G. (Finish Mfr.)

Pyrax, an ingredient for use in the manufacture of wood filler, is a product of R. T. Vanderbilt Co., 230 Park Ave., New York City.

Dicalite, also used in making filler, is a product of The Decalite Co., 756 S. Broadway, Los Angeles, Calif.

Good Pearl Essence Doesn't Yellow

In reference to the published letter in June 1939 issue, under the title "Pearl Essence," I notice H. D. Co. refers to my article in the April number and then complains about pearl essence finishes turning yellow.

I thought that explaining the high heats and exposures the pearl essence was subjected to would impress your readers with the fact that yellowing does not come from the pearl essence, but comes either from impurities attached to same as a result of faulty manufacture, or is caused by the poor vehicle in which the pearl essence has been incorporated.

Blanchit
Reg. U. S. Pat. Off.
Wood Bleach
Made by
L. R. van ALLEN COMPANY
(Patent Licensee) CHICAGO

For your information, and for the information of anyone else who would like to make a test, we will be glad to send them a little string of pearls made with a clear bleached-cotton solution and pearl essence, and we will be glad to have them expose it to sunlight for the next two years or more if they desire. We are certain no yellowing will occur. We have samples of pearl essence in cellulose acetate plastics which are more than six years old and we have failed to see the slightest yellowing in same.

Please understand that it is not necessary to add any blueing to pearl essence to make it look white. Pearl essence is white by itself and it will stand up by itself, if properly manufactured and if properly formulated.—H. E. MATTIN, Mearl Corp.

Whirly-Jig Dipping

Would greatly appreciate your sending me the names of manufacturers of Whirly-Jig dipping equipment. This information is to be used with regard to finishing injection molded articles molded from cellulose acetate.—C. L. Mfg. Co.

We presume you have in mind a centrifugal whirling machine wherein a mesh basket of parts is dipped into finishing materials, then raised clear of the material and rotated rapidly (all inside a closed container) to remove the excess liquid coating. Two manufacturers offer machines of this type and we are advising them of your inquiry.—ED.

Termite-proof Paint: Raincoat for Paint

In February issue of a publication, "New Ideas," by Hugo Gernsback, 99 Hudson St., New York City, we find on page 352 an article about "a chemical to be mixed in small quantities with paint to prevent the growth of fungus and to prevent termites from boring through the film;" and on page 369, "Process provides 'raincoat' for paint. This is a liquid compound which when mixed with ordinary paint makes the paint stick to a wet surface."

We are very much interested to produce both materials here (Australia) under license to the original inventor in U. S. A., and would like to have a small sample of both of the products as quickly as possible.

Will you be good enough to find out for us who the manufacturers of the two items are and contact them for us, with the request to

send us the samples C. O. D., and to write us whether they are prepared to grant us a manufacturing and selling license for Australasia? —T. K. P. Co., Sydney, N. S. W.

Can some reader supply the information requested by T. K. P. Co.? The magazine, "New Ideas," has been discontinued, therefore no information is available from that source.—ED.

Finish for Laboratory Furniture

YOUR JUNE ISSUE PAGE THIRTY FOUR STATES THAT A MATERIAL WAS RECENTLY TESTED AND WITHSTOOD ALL TESTS SPECIFIED PLEASE WIRE US COLLECT NAME OF MATERIAL AND NAME AND ADDRESS OF THE MANUFACTURERS OF SAME THANK YOU—U. Mfg. Co.

We were quite interested in the article, "Chemically-Resistant Finishes for Laboratory Furniture," which appeared on pages 30 to 35 of July 1939 issue of INDUSTRIAL FINISHING. We are unable to locate our June copy to read the first half of this article and wonder if we could prevail upon you to send an additional copy of the June issue.

Our company maintains a research fellowship on chemical-resistant finishes for laboratory furniture at the Institute of Paper Chemistry, and this article is of interest to us.—W. Mfg. Co. (Laboratory Furniture).

June issue has been sent.—ED.

In the June issue of INDUSTRIAL FINISHING, Mr. Masterson's article, "Chemically Resistant Finishes for Laboratory Furniture," has interested us considerably. Would you please advise us the name of the supplier of the finishing materials described? We will appreciate this information greatly.—B. Furn. Co.

Several other inquiries referring to this article have been received.

Paint Drum Lifts

Kindly let us have the names of manufacturers of paint drum lifts. We have carefully gone over your June 1939 issue of INDUSTRIAL FINISHING, and have been unable to locate the name of a supplier of such equipment.—O. R. Co.

Names of two suppliers of this type of equipment have been supplied, in reply to this request. We agree that the equipment should be advertised in INDUSTRIAL FINISHING, which is so carefully read by key men in thousands of industrial establishments.—ED.

Fluorescent Paint

Please advise me where I can obtain fluorescent paint.—C. R. (Signs).

Names of several concerns have been supplied in reply to this inquiry.—ED.

Infra Red Ray Drying

On page 9 of June issue of INDUSTRIAL FINISHING, under the title, "Infra Red Ray Drying Equipment," you mention the names of three concerns who are interested in Infra Red Ray lamps and the equipment. If you will be kind enough to give us the full names and addresses of these three, we will be pleased to send them complete data on Infra Red Ray Drying.—North American Electric Lamp Co., St. Louis, Mo.

Synthetic Baking Enamel for Zinc

We are interested in item No. 290, which appeared on page 32 of February issue of INDUSTRIAL FINISHING. Would you be good enough to either send this letter to the company responsible for the development of the material referred to, or furnish us this information direct?—E. E. Zinc Co.

Polyvinyl Alcohol

Will you kindly refer this letter to the manufacturer or distributor of Polyvinyl Alcohol, as mentioned on page 64 of June 1939 issue of INDUSTRIAL FINISHING? We would like to have more complete information regarding the properties and working qualities of Polyvinyl Alcohol, together with a quotation on same.—L. Mills, Inc. (Shade Cloths).

Thin Finished Metal Strips Wanted

Can you put us in touch with a manufacturer who can supply thin-gage metal (.015 or .020-in.) narrow widths (1-in., 1½-in., etc.) coiled or in strips of 9, 10 or 12-ft. lengths,

lacquered in good hard finish in any color such as blue, black, green, brown, etc.? We want finished metal that can be fabricated by us in either punched or rolled shapes, without cracking, chipping or scratching the finish.—C. Art Co. (Price Cards and Signs for Every Purpose).

Waterproof Finish

In January 1938 issue, page 11, we read an article entitled "Waterproofs Small Fiber Articles." Please give us the address of S. R. Chemical Co., who will try out a few samples for us.—L. R. Co. (Commercial Signs).

The information has been given.

While looking over your fine magazine we notice that you keep your readers well informed regarding new developments.—N-T Co.

Windshield Tinting Lacquer

We are interested in knowing if there is a lacquer of any kind which can be applied to the (automobile) glass windshield, which acts in somewhat the same way as sun glasses—to cast off the strong reflection of the sun?—F. B. Co. (Brewers of Beer and Ale).

Porcelain Repair

WIRE COLLECT MANUFACTURERS NAME PORCELAIN REPAIR FINISH ON PAGE 21 MAY 1938 ISSUE INDUSTRIAL FINISHING—E. E. Co.

It's Universal Shellac Stick Co., New York, N. Y., see their advertisement on page 65 of same issue.

Lacquer for Paper

Can you advise us by return mail where we can get a clear lacquer which dries white, for paper coating, as mentioned in your INDUSTRIAL FINISHING some time back; or refer our inquiry to this company?—T. T. Co. ("Trantex" for embossers of leather, textile, fiber, rubber & paper novelties).

Opens Consulting Laboratory

George Musico, for the past five years head of the Research Laboratory of The Lea Mfg. Co., Waterbury, Conn., has resigned to open a consulting laboratory at 480 Watertown Ave., Waterbury, Conn., serving the metal-working and allied trades. He will be retained by The Lea Mfg. Co. as consultant, cooperating with their Research Laboratory.

"Dulux" Finish on Display

To celebrate the sixth anniversary of Dulux refrigerator finish, the duPont Co. staged an interesting Refrigerator Show in its Exhibit on the Boardwalk in Atlantic City, N. J., during the period of June 5th to June 19th.

A window display, having as its central theme a huge birthday cake with lighted candles, announced the sixth birthday of Dulux, "the modern refrigerator finish." The wearing qualities of this finish were illustrated in the background, while panels at the right and left, containing enlargements of factory and domestic scenes, pointed out its acceptance by manufacturers and the vast number of Dulux-finished refrigerators in use in American homes.

As a special feature, a section of the "Wonder World of Chemistry" lecture, which was given at frequent intervals each day at the Exhibit was devoted to Dulux. Describing Dupont's method of pre-testing finishes and the use of their products in home and industry, the lecturers, through a series of dramatic tests, demonstrated the wearing qualities of this finish and its ability to withstand the punishment to which a refrigerator finish is subjected in the home.

Sterling Products Co. Opens Plant in Los Angeles

Sterling Products Co. of Detroit, Mich., and Los Angeles, Calif. (manufacturers of Sterling Speed-Bloc sanders and air accessories for sanding, finishing and polishing) announce the completion of their new, uptodate plant at 8925 Aguinaldo

Located at 8925 Aguinaldo Ave., Los Angeles, Calif.

Ave., Los Angeles, Calif. The building is of white stone, semi-modern in architecture and design, air-conditioned throughout and has over 10,000-sq.ft. of floor space. Every device that will materially speed up production, further enhance an already high quality product and yet maintain minimum costs, has been installed.

According to Mr. N. B. Herman, Vice President: "The purpose in establishing this plant at Los Angeles was to enable us to render still better service to our customers in the far west. However, shipments to the rest of the country and for export will be handled from Detroit, as before."

Classified Advertising

Rate: 45 cents per line per insertion—minimum $1.35

INDUSTRIAL SALESMANAGER.

An Ohio Corporation doing a strictly Industrial business in Paints, Varnishes, Enamels, Stains, Fillers and Lacquers, has an opening for a capable and experienced salesmanager—willing to do field work—not over 45 years of age. Real opportunity for the right man. Address IF-748, care Industrial Finishing.

FINISHING FOREMAN WANTED

A manufacturing concern in Connecticut has position open to an experienced finishing foreman. He must be familiar at least with all kinds of plating, dipping, ball rolling and similar operations, lacquering both dip and spray, also all kinds of buffing. He need not have an intimate knowledge of all of these operations but must know at least what is required and how to get it. Preference will be given to one who has specialized in plating with a knowledge of the other two departments rather than one who has specialized in buffing or lacquering with a general knowledge of plating. Applicants please state age, experience and salary desired, also give references. Address IF-758, care Industrial Finishing.

SALESMAN WANTED

To handle lacquers and industrial finishes in city of Chicago. State age, experience, and other qualifications. Address IF-759, care Industrial Finishing.

"PEERLESS" SPRAY BOOTHS.

Efficient design; sturdy construction—yet lowest prices: 4-ft. only $56.00; 6-ft. $85.00; 8-ft. $100.00, complete with CHAMPION Exhausters.

INDUSTRIAL EQUIPMENT CO.
208 N. Wells st. Chicago

Save 40% to 60%

We recently acquired, through a single purchase, a large quantity of standard spray booths. These booths were sold at auction and we made a flat bid on the entire plant, including all spray equipment, booths, exhaust fans, pressure tanks, etc. WE BOUGHT THIS EQUIPMENT RIGHT . . . AND WE CAN SELL IT RIGHT.

Being authorized dealers for Curtis compressors, we are in position to offer a liberal trade allowance on your old compressors and our activities in this connection enable us to supply any size rebuilt, fully guaranteed compressor.

We can also rebuild and recondition any of your present spray equipment or compressors.

M. & E. MANUFACTURING CO.
720 S. Meridian St., Indianapolis, Ind.
Est. 1913
Distributors of Binks entire line.

Practical Japanning and Enameling

HERE is the first authoritative handbook of its kind, containing much information that has never before been published. You will find between its covers facts, processes, and formulae that have been considered secret by many japanners.

The author has actually been doing this work for others for many years and he knows whereof he speaks. No one has ever gone into the subject of mental finishing more deeply than he nor has the subject ever been explained so clearly and effectively. This book was eight years in preparation.

Color plates and a multitude of tables and illustrations make the text even more clear and understandable. The volume is bound in harmony with its companions of the Practical Finishing Series and makes a rich, attractive appearance . . . 22 chapters.

Price $3.50 . . . . *money refunded if book is not satisfactory.*

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222 EAST OHIO ST.
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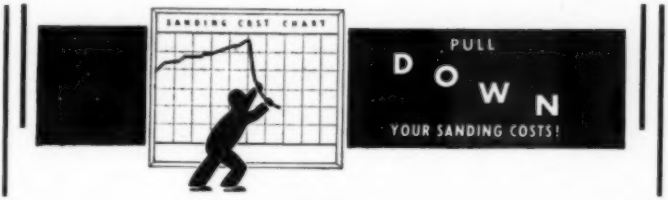

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STERLING *Speed-Bloc* SANDER

Today, more than ever, production men have to put greater stress on cutting of costs. The Sterling Speed-Bloc Sander meets this situation.

This fast, efficient tool is daily saving 25% to 75% in labor and abrasive costs in leading plants over the country. It will save plenty for you.

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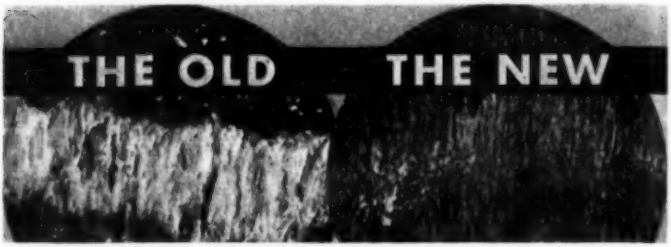

ORDINARY WOOD FINISH **H. T. A. ZAPONITE**

Wood panels magnified 15 times after being scratched with tip of pen-knife.

Both of these panels were finished over five months ago. One was finished with one of the best present-day wood finishes, the other in ZAPON'S new H. T. A.

The results speak for themselves. Note how the ordinary finish is badly marred white—note the absence of fracturing, the almost imperceptible effect on H. T. A.

H. T. A. ZAPONITE is a new wood finish employing a new technique. Applied in one coat it uses approximately only half as much solids as a three-coat finish yet provides equal fullness and body and even more durability!

Moreover, production time, labor costs, floor space are amazingly reduced.

Our Technical Department will demonstrate how quickly and simply H. T. A. can be adapted to your finishing procedure.

ZAPONITE — Reg. U. S. Pat. Off.